Exhibits D, G & H have been denied on the basis that the information is confidential, being trade secrets and/or proprietary commercial/financial pursuant to N.J.S.A. 47:1A-1.1.

SOLVAY

April 17, 2019

VIA OVERNIGHT DELIVERY

Mr. Shawn LaTourette
Deputy Commissioner, Legal and Regulatory Affairs
New Jersey Department of Environmental Protection
401 East State Street
Trenton, NJ 08625

Re: **Statewide PFAS Directive, Information Request and Notice to Insurers**

Dear Mr. LaTourette:

Enclosed within this envelope you will find, on behalf of Solvay Specialty Polymers USA, LLC (successor by merger to Solvay Solexis, Inc. and hereinafter "Solvay"), two original copies of Solvay's response to the New Jersey Department of Environmental Protection's ("DEP") Statewide PFAS Directive, Information Request and Notice to Insurers, dated March 25, 2019 (the "Directive") pursuant to NJAC 7:26C-9.11(f).

Two copies are provided because Solvay's response includes confidential trade secret and proprietary information that is protected under Subchapter 15 of the Administrative Requirements for the Remediation of Contaminated Sites ("ARRCS"), the New Jersey Open Public Records Law ("OPRA") and applicable case law. Accordingly, you will find within the envelope both a redacted public inspection copy of Solvay's response and, in a separate envelope marked "**CONFIDENTIAL**" on both sides, a non-redacted copy of Solvay's response. A fully executed Confidentiality Request Form is also included within this package.

Solvay expects that the Department will restrict access to the confidential version of Solvay's response, as provided for in the ARRCS, OPRA and applicable case law.

Sincerely,

Charles M. Jones

Charles M. Jones
West Deptford Facility Manager

Enclosure: Solvay Specialty Polymers USA, LLC response to the New Jersey Department of Environmental Protection's ("DEP") Statewide PFAS Directive

Fox Rothschild LLP
ATTORNEYS AT LAW

Mail: P. O. Box 5231, Princeton, NJ 08543-5231
Princeton Pike Corporate Center
997 Lenox Drive
Lawrenceville, NJ 08648-2311
Tel (609) 896-3600 Fax (609) 896-1469
www.foxrothschild.com

Gerard P. Norton
Office Managing Partner

CHRISTOPHER M. ROE
Direct No: 610.458.4987
Email: CRoe@FoxRothschild.com

Public Inspection Copy

April 17, 2019

VIA FED-EX DELIVERY

Mr. Shawn LaTourette
Deputy Commissioner, Legal and Regulatory Affairs
New Jersey Department of Environmental Protection
401 East State Street
Trenton, NJ 08625

Re: Statewide PFAS Directive, Information Request and Notice to Insurers

Dear Mr. LaTourette:

On behalf of Solvay Specialty Polymers USA, LLC (successor by merger to Solvay Solexis, Inc. and hereinafter "Solvay"), we write in response to the New Jersey Department of Environmental Protection's ("DEP") Statewide PFAS Directive, Information Request and Notice to Insurers, dated March 25, 2019 (the "Directive") pursuant to N.J.A.C. 7:26C-9.11(f).[1]

The Directive seeks to require Solvay and a few other companies to investigate and remediate all per- and polyfluoroalkyl substances ("PFAS") throughout New Jersey. There is no credible basis for DEP to assert that Solvay, which has operated a ***single manufacturing facility*** located at 10 Leonard Lane in West Deptford, Gloucester County (the "West Deptford Facility") and that has ***never manufactured PFAS***, is responsible for Statewide PFAS contamination. While the Directive does not acknowledge the extensive work Solvay already has undertaken and what has been learned as a result of this work, Solvay intends to continue on the path toward completing its investigation and remediation in accordance with applicable law. Solvay, of course, has been investigating and remediating PFAS impacts potentially attributable to its West Deptford Facility since 2013 – at a cost of more than $25 million to date.

[1] In submitting this letter, Solvay does not admit any fact or liability, and expressly preserves any and all rights and defenses it may have at law or in equity.

As a matter of law, however, Solvay is ***not*** responsible for the PFAS impacts caused by other parties. Accordingly, Solvay has several objectively reasonable bases, as well as good cause under the law, not to comply with the Directive, including the following: (i) Solvay is not liable under the Spill Act for PFAS impacts not caused by its West Deptford Facility operations, (ii) DEP's decision to try to shift the cost of investigating and remediating all PFAS impacts in New Jersey to Solvay and a few other parties is unreasonable, especially given (a) DEP's knowledge of multiple other PFAS sources to New Jersey's environment[2] and (b) DEP's unwillingness thus far to engage in any meaningful conversation regarding other sources, despite Solvay's repeated requests, and (iii) DEP's past cost claim is, at this time, lacking any support from which Solvay could evaluate the causal nexus and reasonableness of the costs incurred.[3]

Nevertheless, despite—and without waiver of—its good cause defenses, Solvay is complying with certain elements of the Directive now and is willing to comply with other elements of the Directive, as set forth in pages 13 through 15 of this response. Solvay looks forward to engaging in the near term in what we hope will be a more constructive dialogue with DEP.

RELEVANT BACKGROUND

The Directive is at odds with the facts of Solvay's actions and investigations over many years. Solvay has been actively addressing environmental impacts attributable to it in the area of its manufacturing facility, and it has been cooperating with DEP. Solvay's commitment to address the West Deptford Facility impacts has never wavered, and is fully consistent with Solvay's corporate principles.

As explained in the sections below, Solvay's New Jersey manufacturing operations are limited to the West Deptford Facility, Solvay has never manufactured PFAS at the West Deptford Facility, Solvay voluntarily reduced its use of products containing perfluorononanoic acid and perfluorooctanoic acid starting as early as 2003, and Solvay already has undertaken and

---

[2] As recently as April 8, 2019, in its letter to the United States Environmental Protection Agency ("USEPA"), DEP expressly acknowledged that other sites are likely sources of PFNA and other PFAS to New Jersey's environment. [Ltr. from M. J. Pedersen, Assistant Commissioner Site Remediation and Waste Management Program DEP to J. Prince, Acting Dir., Emergency and Remedial Response Division, USEPA, at 2 (Apr. 8, 2019).]

[3] For instance, at least with respect to Solvay, DEP fails to comply with the necessary Directive elements found at N.J.A.C. 7:26C-9.11(c), including necessary causal nexus, necessary substantiation and necessary scope-related details.

will continue to undertake extensive efforts to address impacts attributable to the West Deptford Facility in cooperation with DEP.

Ownership and Operation of the West Deptford Facility

With respect to Solvay, the Directive focuses on a single facility – the West Deptford Facility. [Directive ¶ 24.] The West Deptford Facility was undeveloped land until approximately 1961, when it was developed by National Steel Company. [ECRA Site Evaluation Submittal (Fred C. Hart Assoc.) (Sept. 1989).] In 1970, Pennwalt Ltd., ("Pennwalt") acquired the West Deptford Facility. [Remedial Investigation Report (May 6, 2014).] In 1985, Pennwalt Corporation began manufacturing polyvinylidene fluoride ("PVDF"), a type of fluoropolymer, at the West Deptford Facility. [Work Plan Perfluoroalkyl Compounds at 1-2 (Sept. 22, 2015).][4] Pennwalt Corporation became Atochem North America, Inc. ("Atochem"), in 1989. We understand that Arkema Inc. is a successor to liabilities of Pennwalt/Atochem related to the West Deptford Facility.[5] On October 31, 1990, Atochem sold the West Deptford Facility to Ausimont USA, Inc. [*Id.*] Solvay acquired Ausimont USA, Inc. in 2002. Ausimont USA, Inc. changed its name to Solvay Solexis in 2003 and in 2012, Solvay Solexis was merged into Solvay Specialty Polymers USA, LLC. Solvay Specialty Polymers USA, LLC has operated the plant since 2012.

To manufacture PVDF, a surfactant – a processing aid used to create an emulsion process – is needed. From 1985 until 2010, Surflon® was the primary surfactant used at the West Deptford Facility, first by Pennwalt (Arkema) and later by Ausimont (Solvay). [*Id.*] Surflon® predominantly contains ammonium perfluorononanoate (hereinafter referred to as "PFNA"). Importantly, ***Solvay did not manufacture Surflon®*** at the West Deptford Facility; instead, Solvay purchased it from a supplier. During the full years when Solvay was primarily using Surflon® as a processing aid (from 1991 through 2009), Solvay used approximately 6,500 kilograms of Surflon® on average per year at the West Deptford Facility. [Ltr. from T. Buggey (Roux Associates) to E. Bergman (DEP) (Nov. 15, 2013).] In addition, from 1995 through 2003, Solvay used a small amount (1,300 kilograms on average per year) of a different surfactant, sodium perfluorooctanoate ("NaPFO"), which appears as PFOA in the environment. [Work Plan Perfluoroalkyl Compounds at 1-2.] As with Surflon®, ***Solvay did not manufacture NaPFO*** at the West Deptford Facility; rather, that surfactant was purchased from a supplier. [Directive ¶ 25.]

---

[4] DEP already has copies of all the documents cited in this letter.
[5] Pennwalt, Atochem, and Arkema are unrelated to Solvay.

The finished PVDF is sold to Solvay's customers, which use the PVDF as a component in other products and applications, such as coatings and lithium batteries.

Solvay Voluntarily Eliminated PFNA and PFOA Use in the 2000s

In 2006, USEPA asked Solvay (and other companies) to participate in its "PFOA Stewardship Program." [Fact Sheet: 2010/2015 PFOA Stewardship Program.[6]] Solvay agreed to participate. [*Id.*]

The PFOA Stewardship Program encouraged participants, including Solvay, to achieve two goals: (i) a 95% reduction, measured from a year 2000 baseline, "in both facility emissions to all media of [perfluorooctanoic acid ("PFOA")], precursor chemicals that can break down to PFOA, and related higher homologue chemicals, and product content levels of these chemicals," and (ii) "the elimination of these chemicals from emissions and products by 2015." [*Id.*]

Solvay ceased its use of NaPFO in 2003 (before the PFOA Stewardship Program even began) and met the PFOA Stewardship Program goals at the West Deptford Facility by ceasing its use of Surflon® in 2010. [*Id.*] Documentation of Solvay's reductions in PFAS use and emissions was provided to USEPA in the form of annual progress reports from 2007 through 2015, which are publicly available on USEPA's website.[7]

Solvay Self-Initiated and Agreed to Investigate and Remediate Impacts Attributable to the West Deptford Facility in 2013 Before Any Regulatory Standards Existed for PFAS Compounds

In 2009, unbeknownst to Solvay, sampling was conducted by the Delaware River Basin Commission ("DRBC") and DEP in the Delaware River and in a public water supply in the Borough of Paulsboro. That sampling detected PFNA, PFOA, and perfluorooctanesulfonic acid ("PFOS"), another PFAS compound. PFOS is not a component of any of the products used by the West Deptford Facility. For the next four years, DEP did not communicate those sampling results to the public, including Solvay, nor did DEP request that Solvay take any action with respect to PFAS impacts potentially attributable to the West Deptford Facility. Finally, in late summer 2013, in response to Open Public Records Act requests by a third party, DEP publically

---

[6] Available at https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#launch.

[7] Available at https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/20102015-pfoa-stewardship-program-2014-annual-progress#table1.

released the 2009 sampling data, but still did not notify Solvay directly. Solvay learned of the existence of the sampling results instead through the media in August 2013. Immediately thereafter, Solvay self-initiated contact with DEP and offered to voluntarily investigate possible PFAS drinking water impacts in the West Deptford area, regardless of the potential source.

Specifically, in September 2013, at Solvay's request, Solvay met with DEP and USEPA to discuss the now-public 2009 sampling results and Solvay's initial plan to investigate possible PFAS drinking water impacts in a broad area as well as any site-related PFAS environmental impacts at the West Deptford Facility. That same month, Solvay retained a Licensed Site Remediation Professional ("LSRP"), Thomas R. Buggey of Roux Associates, who is charged with ensuring compliance with New Jersey environmental statutes and DEP's regulations, and began preparing a remedial investigation work plan. Solvay's initial work, which spanned from November 2013 until March 2015, included the following:

- Expedited sampling of municipal water from seven different townships surrounding the West Deptford Facility to assess possible PFAS drinking water impacts, regardless of source and in advance of any site-related environmental investigation [Work Plan Perfluoroalkyl Compounds at 1-4];
- Expedited well search and sampling of private drinking water supply wells to assess possible PFAS drinking water impacts, regardless of source and in advance of any site-related environmental investigation [*id.*];
- Groundwater sampling of Solvay's monitoring wells, both at the West Deptford Facility and from off-site areas [*id.*];
- Groundwater sampling of temporary well points between the West Deptford Facility and Woodbury Creek to the east [*id.*];
- Surface water, sediment, and pore water sampling from the Delaware River, including sampling along 80 miles of the Delaware River [*id.* at 1-5];
- Air dispersion modeling of potential and estimated historic PFNA and PFOA emissions from the West Deptford Facility based on extensive and well documented DEP and USEPA technical input and feedback concerning the appropriate means and methods to be used for such air dispersion modeling

[*id.*]. *See* Exhibit F (Table 1: Key Agency Communications on Air Modeling for the PFAS Investigation at West Deptford, NJ, 2013 to 2015) and Exhibit F.1 (Copies of Key Air Modeling Communications); and

- Solvay voluntarily installed a carbon treatment component – to address PFAS – to the groundwater remediation system already present at the West Deptford Facility, which was installed years earlier to address volatile organic compound impacts.

Significantly, Solvay undertook all of this initial environmental work ***years before DEP promulgated any proposed or final standards for PFNA or PFOA.*** [Directive ¶ 9 (DEP's Drinking Water Quality Institute ("DWQI") recommended a Maximum Contaminant Level ("MCL") for PFNA in July 2015); *id.* ¶ 10 (DWQI recommended MCL for PFOA in March 2017); *id.* ¶ 11 (DWQI recommended MCL for PFOS in November 2017); *id.* ¶ 12 (DEP adopted a groundwater quality standard for PFNA in January 2018); *id.* ¶ 13 (DEP adopted MCL for PFNA in September 2018); *id.* ¶ 15 (DEP established interim groundwater quality criteria for PFOA and PFOS in March 2019).]

In January 2014, DEP issued a PFAS drinking water health advisory for infants up to one year of age in Paulsboro. [Ltr. from K. Fell (DEP) to L. Ruggieri (Borough of Paulsboro) (Jan. 17, 2014), attaching January 2014 DEP Fact Sheet: PFNA in Paulsboro Water Well No. 7.] Even though Solvay's environmental investigation was in its earliest stages and had not established any nexus to Paulsboro drinking water, Solvay – again voluntarily – agreed to provide bottled water to Paulsboro residents. In December 2014, Solvay, as part of a settlement and without admission of any fact or liability, also agreed to design and install a PFAS treatment system on "Well No. 7" in Paulsboro, without awaiting any determination that the PFAS impacts in Paulsboro were attributable, in whole or in part, to the West Deptford Facility.[8] This treatment system has been in place and operational since June 2016.

After completing its initial investigation, Solvay met with DEP in June 2015 to discuss the results and next steps. [Work Plan Perfluoroalkyl Compounds at 1-5.] In July 2015, DEP provided its comments on the work performed to date, which Solvay incorporated in a remedial

---

[8] Additional data since 2014 shows that there are multiple likely PFAS sources affecting Paulsboro drinking water completely unrelated to the West Deptford Facility. To date, these obvious likely sources remain both unacknowledged and uninvestigated by DEP.

investigation work plan that was submitted to DEP in September 2015. [*Id.*] The September 2015 work plan proposed the collection of (i) groundwater samples from both onsite and offsite monitoring wells, (ii) soil samples from the West Deptford Facility, and (iii) surface water and sediment samples from creeks adjacent to the West Deptford Facility. [*Id.* at 2-1.] The September 2015 work plan also proposed to evaluate the "distribution of [perfluorochemicals] and their fate in the environment in the vicinity of" the West Deptford Facility. [*Id.*]

After receiving LSRP and DEP input and approval on the September 2015 work plan, Solvay undertook this second phase of investigative work. The results were reported to DEP by the LSRP in June 2017. [Perfluoroalkyl Compound Investigation Report for the West Deptford Facility (June 30, 2017).] Solvay then prepared a third work plan approved by the LSRP in May 2018, which was also submitted to and reviewed by DEP. [Technical Memorandum - Integral to NJDEP (May 17, 2018).] After input by DEP, Solvay installed additional offsite groundwater monitoring wells and collected more groundwater samples from offsite locations.

In addition, in January 2019, Solvay self-initiated and implemented (again with notice to DEP) an engineered cap/surface barrier at the West Deptford Facility as an interim remedial measure.

All of Solvay's work plans were developed in conjunction with the LSRP and submitted to DEP beforehand for its review and input. All of the results of Solvay's investigation through early 2017 have been provided to DEP. [Exhibit A for Table 1, PFAS Work Plans and Reports, which Solvay has already provided to DEP and which are incorporated herein by reference]. Results from 2018 are being compiled in a report that will be provided to DEP in the coming months.

Among the work performed by Solvay was an air dispersion model – a model developed with extensive technical input and advice from both DEP and USEPA[9] – that concluded that no significant amount of PFNA or PFOA emitted from Solvay operations would have been deposited beyond the West Deptford Facility property boundary and that depositions decreased significantly with distance from the facility.[10] On July 31, 2015, Solvay received some initial feedback from DEP on the results of this air modeling. Solvay responded to that feedback on September 22, 2015. DEP has provided no technical or specific feedback on the model since

---

[9] *See* Exhibit F (Table 1). Key Agency Communications on Air Modeling for the PFAS Investigation at West Deptford, NJ, 2013 to 2015.

[10] Air Modeling Report for Perfluoroalkyl Compounds, Integral Consulting, Inc., March 3, 2015.

2015, but Solvay has unofficially heard from DEP managers that DEP may still not be satisfied with the air modeling results, despite DEP's significant input to the model used.

Among the key findings of Solvay's investigation to date is substantial evidence that there are multiple sources of PFNA and PFOA (as well as PFOS, which Solvay never used) in West Deptford and in Gloucester County that are unconnected to the West Deptford Facility and have not yet been identified. Solvay has repeatedly provided that information to DEP.[11] So far, to Solvay's knowledge, DEP has not investigated other potential sources in the area.

In addition, Solvay has provided DEP with a technically valid, isomer chemistry basis (and supporting data) to explain why branched PFNA found in the investigation area is not linked to the West Deptford Facility. [Perfluoroalkyl Compound Investigation Report (June 30, 2017).] The Surflon® used at the West Deptford Facility only contained linear PFNA. Since branched PFNA has been found, it demonstrates that there is another source(s) of PFNA in the investigation area.

In sum, since 2013, Solvay has aggressively investigated and remediated PFAS impacts potentially attributable to the West Deptford Facility – both onsite and offsite. Solvay has collected more than 1,000 environmental PFAS samples[12] and has spent more than $25 million to investigate PFAS. ***Solvay performed all of this work with LSRP and DEP oversight.*** Although additional work remains, Solvay is ***fully committed*** to completing the investigation and remediation of any PFAS impacts attributable to the West Deptford Facility.

DEP Decides to Issue Solvay the Directive

On March 25, 2019, a decade after DEP obtained PFAS data potentially attributable, at least in part, to the West Deptford Facility, DEP issued Solvay and a few other companies the Directive. The Directive asserts that "PFAS is now ubiquitous in New Jersey" [Directive at 1], and that Solvay and the other respondents "are responsible for PFAS – including PFNA, PFOA, PFOS and their replacement PFAS compounds – that have been discharged or released into New

---

[11] *See* Exhibit B, Summary Report on Potential Sources of PFAS, Gloucester County New Jersey, May 2018, including the enumeration of these submissions in footnote 1 thereof; *see also* Oct. 22, 2015 Letter from C. Jones to M. Pedersen and D. Kennedy, attaching 10/20/2015 Integral Memo entitled "Likely Third Party Sources of PFNA in the Delaware River Watershed and the Environment in and near Gloucester County, New Jersey".

[12] Exhibit A, Table 2. Summary of Environmental Samples Collected by Solvay as Part of the PFAS Investigation at West Deptford, NJ between 2013 and 2019.

Jersey's air, water, and other natural resources[.]" [*Id.* at 2.] Said differently, despite recognizing that PFAS compounds have existed since the 1940s [*id.* ¶ 1], that there are "literally thousands of PFAS compounds" [*id.*], and that Solvay did not begin operating at the West Deptford Facility until 1990 [*id.* ¶ 24], DEP nevertheless asserts that Solvay is "responsible for the significant PFAS contamination across New Jersey and the costs the Department has incurred, and will incur," in addressing PFAS on a Statewide basis [*id.* ¶ 22] – which DEP projects will cost "hundreds of millions of dollars[.]" [*Id.* ¶ 49.]

The Directive does not consider the work that Solvay has done, and continues to do, to characterize and address any discharge from the West Deptford Facility; the Directive is an unnecessary action by DEP as to Solvay and as to the investigation and remediation required related to the West Deptford Facility. The Directive is also unprecedented in scope and devoid of meaningful or reasonable substantiation as to Solvay, especially in light of DEP's acknowledgement that "[t]here are literally thousands of PFAS compounds" [*id.* ¶ 1] and that PFAS contamination is "ubiquitous in New Jersey" [*id.* at 1].

RESPONSE TO FINDINGS

The findings and other allegations throughout the Directive are unsupported and vague, including, without limitation, the allegation of "massive amounts" of Surflon® being discharged by Solvay. In providing this response, Solvay does not admit any of these findings or allegations. Nor does Solvay waive any right to contest them and require proof from DEP in any subsequent proceeding.

SOLVAY IS NOT OBLIGATED TO COMPLY WITH THE DIRECTIVE

Compliance Is Not Required If There Is a Good Cause Defense to the Directive

Under the Spill Act (the predicate statute for the Directive), DEP "may, in its discretion, act to clean up and remove or arrange for the cleanup and removal of [a] discharge or may direct the discharger to clean up and remove, or arrange for the cleanup and removal of, the discharge." [Directive ¶ 58]; N.J.S.A. 58:10-23.11f(a)(1).

The New Jersey Supreme Court has held that recipients of a DEP directive may refuse to comply with that directive where they have a "good cause" (also known as a "good faith") basis for noncompliance. *In re Kimber Petroleum Corp.*, 110 N.J. 69 (1988). "Good cause" exists when the recipient has "an objectively reasonable basis for believing that DEP's directive [is] either invalid or inapplicable to it," which includes "challenges to the reasonableness of the costs

assessed" in the directive. *Id.* at 83, 86. Where such a good cause defense exists, DEP is not entitled to the treble damages provided by the Spill Act. *Id.* at 84.

In short, the touchstone for evaluating a party's good cause defense to a directive is ***reasonableness***: DEP's demands, as set forth in the directive, must be reasonable under the circumstances. *See id.* at 76 ("If a challenging party has reasonable grounds for contesting the validity or applicability of an administrative order, it must be able to do so without penalty"); *id.* at 86 ("an aggrieved party should have the right, in an action for reimbursement to recover costs, to demonstrate that an element of the costs imposed by DEP is unreasonable. An identical contention raised on an objectively reasonable basis could constitute a 'good cause defense' to a pre-payment enforcement directive."); *id.* at 87 ("good-cause defenses include challenges to the reasonableness of the costs assessed"); *id.* ("The provisions of the DEP directive ordering the payment of removal costs are valid and enforceable subject, however, to any good-cause defense that may be raised by the [directive recipients].").

Solvay Has Good Cause Defenses to the Directive

Solvay Is Not Liable for Statewide PFAS Impacts

As an initial matter, Solvay does ***not*** dispute that it needs to investigate and remediate PFAS impacts attributable to the West Deptford Facility. Solvay has been and remains fully committed to completing that work. But Solvay's commitment to address PFAS impacts attributable to the West Deptford Facility does not mean that Solvay is obligated under the Spill Act to investigate and remediate PFAS throughout New Jersey.

Spill Act liability only exists where DEP can prove two causal elements, that there is a reasonable nexus both: (i) between a Solvay discharge of PFAS and the PFAS contamination at issue, and (ii) between that Solvay PFAS discharge and the costs incurred by DEP. *N.J. Dep't of Envtl. Prot. v. Dimant*, 212 N.J. 153, 177 (2012); *Magic Petroleum Corp. v. Exxon Mobil Corp.*, 218 N.J. 390, 408 (2014) (explaining that *Dimant* held that "to recover costs from [a] responsible party, DEP must show [a] reasonable nexus between [the] discharge, discharger and contamination at the damaged site"). In short, the Spill Act mandates, and *Dimant* holds, that a discharger is responsible only for its own discharge, not those of others. *Dimant,* 212 N.J. at 182.

Here, the Directive fails to provide any basis explaining why DEP believes that Solvay is responsible for PFAS contamination in 70 different private potable wells, some of which are located more than 10 miles away from the West Deptford Facility. Nor does the Directive

explain how DEP has reached the conclusion that Solvay – which has operated a single facility in Gloucester County and has never manufactured PFAS – could possibly be responsible for ***Statewide*** PFAS contamination. The complete absence of any explanation of how Solvay is responsible for the breadth of contamination at issue in the Directive is more than sufficient to establish a good cause, good faith, objective basis for Solvay not to comply with the Directive at this time.

DEP's Approach in the Directive Is Unreasonable

Even if the Directive included some basis for why Solvay is responsible to address PFAS impacts in 70 different private potable wells or on a Statewide basis (which it does not), the overall unreasonableness of DEP's approach provides Solvay with a good cause basis not to comply with the Directive.

First, DEP has been intimately involved with Solvay's investigation and remediation of PFAS impacts at the West Deptford Facility since Solvay initially reached out to DEP in 2013. That DEP would weigh in, review, and approve work plans Solvay has performed at and around the West Deptford Facility for more than five years, and now, without prior notice, issue a Statewide PFAS Directive against Solvay, is not reasonable. *See, e.g., In re Kimber Petroleum Corp.*, 110 N.J. at 76; *N.J. Dep't of Envtl. Prot. v. Essex Chem. Corp.*, MID-L-5685-07, slip op. at 8 (July 23, 2010) ("Nothing in the Spill Act gives [NJDEP] the authority to make unreasonable demands on responsible parties, particularly where, as here, that party has been cooperating fully with the [NJDEP's Site Remediation Program]."), *affirmed* 2012 N.J. Super. Unpub. LEXIS 593 (App. Div. Mar. 20, 2012).

Second, DEP's decision to target Solvay for all PFAS impacts in New Jersey is patently unreasonable. As DEP is aware, not only is Solvay not responsible for Statewide PFAS impacts, Solvay is not even responsible for all PFAS impacts in the one county in which it operates. Specifically, Solvay most recently provided DEP with detailed information on other potential PFAS sources in Gloucester County in May 2018 – for example, gasket/seal manufacturers; historic aqueous film forming foam use at industrial operations, refineries, and fire training areas; other fluorochemical facilities; petrochemical facilities; and landfills. However, it does not appear that DEP has taken any action to investigate those potential sources despite Solvay's repeated requests and provision of detailed written supporting information. [Exhibit B, Summary Report on Potential Sources of PFAS in Gloucester County at 1-1 (May 2018) ("This report provides specific examples of evidence that there are likely multiple sources that released PFNA and other PFAS to the environment....This report supplements previous information on potential sources and data submitted to [DEP]. Solvay continues to urge NJDEP to take the

actions necessary to identify the sources and begin to investigate them.").] As USEPA recently recognized in its "PFAS Action Plan," PFAS have been used "in a variety of consumer products and industrial processes, including firefighting foams, chemical processing, building/ construction, aerospace, electronics, semiconductor and automotive industries, stain- and water-resistant coatings (*e.g.*, carpets and rain repellant clothing), food packaging, and in waxes and cleaners." [USEPA PFAS Action Plan at 11 (Feb. 2019).]

In fact, DEP itself expressly recognizes there are many potential sources of PFNA, PFOA, and other PFAS compounds to New Jersey's environment: "Information on PFNA and other per- and polyfluoroalkyl substances (PFAS) compounds can be found at many different sites, and EPA and Interstate Technology and Regulatory Council guidance is available to identify the various industries and sites where these compounds are likely to be found. . . . Landfills and other sites [in New Jersey] where chemical waste were disposed (e.g., BROS) should be prioritized." [Ltr. from M. J. Pedersen, Assistant Commissioner Site Remediation and Waste Management Program DEP to J. Prince, Acting Dir., Emergency and Remedial Response Division, USEPA, at 2 (Apr. 8, 2019).] Notably, the BROS site is in close proximity to at least six wells DEP seeks to hold Solvay responsible for in the Directive. It is not reasonable, under these circumstances, for DEP to seek to shift the burden of investigating and remediating PFAS on a Statewide basis to Solvay and a handful of other companies.

In sum, Solvay need not comply with the Directive, which is an unreasonable attempt to saddle Solvay with liability for PFAS impacts wholly unrelated to its operations at the West Deptford Facility.

DEP Has Not Provided Evidence That Its Past Costs Claim Is Reasonable

The Directive requests that Solvay pay DEP approximately $3.1 million to reimburse the agency for the costs incurred to address PFNA and PFOA "from the area surrounding" the West Deptford Facility. [Directive ¶ 47.] Solvay agrees that DEP has incurred past costs that are reasonably reimbursable by Solvay. Solvay even offered to do so with regard to then-current past costs Solvay agreed were attributable to the West Deptford Facility in February 2016 – with no DEP response to date. Solvay has been and remains willing to reimburse DEP for its reasonable costs incurred in responding to PFAS impacts ***attributable to the West Deptford Facility*** under the reasoning of *Dimant*. However, Solvay is unable, at this time, to ascertain the amount of those costs. Simply put, it is not clear that all of the $3.1 million incurred by DEP are costs fairly attributable to West Deptford Facility contamination, as opposed to contamination from other sources that was and is present in the "area surrounding" the West Deptford Facility.

Accordingly, given its inability at this time to ascertain the reasonableness of DEP's past cost claim, Solvay has a good cause defense to this aspect of the Directive and declines at this time to reimburse DEP for the requested $3.1 million. *See In re Kimber Petroleum Corp.*, 110 N.J. at 87 ("good cause defenses include challenges to the reasonableness of the costs assessed").

SOLVAY NEVERTHELESS WILL COMPLY WITH THE DIRECTIVE AS SET FORTH BELOW

Notwithstanding its multiple good cause defenses to the Directive discussed above, Solvay is complying with certain elements of the Directive now and is willing to comply with other elements of the Directive as set forth below, subject to: (i) receiving the legally-required information and data DEP relies upon in substantiating various elements of the Directive, including the data and information that DEP believes support the specific requirements directed to Solvay in paragraphs 63 and 64 of the Directive; and (ii) meeting(s) with Solvay (which Solvay previously requested) to discuss impacts attributable to the West Deptford Facility versus those attributable to other sources.

More specifically:

- With this letter and enclosed as Exhibits C and D, Solvay is providing to DEP the information requested concerning its historic use of PFNA and PFOA (PFOS was not used at the West Deptford Facility), and its use of PFAS replacement chemicals [Directive ¶¶ 68-69]. Solvay previously provided much of this information to DEP;[13]
- Solvay is willing to enter good faith discussions with DEP to resolve the agency's past cost claim of $3,105,084.91, consistent with New Jersey law, and to promptly pay legally justified and reasonable amounts pursuant to N.J.A.C. 7:26C-9.11(f)2;
- Solvay is willing to enter good faith settlement discussions with DEP concerning potential future costs and any damages attributable to West Deptford Facility PFAS impacts;

[13] *See* Ltr. from T. Buggey (Roux Associates) to E. Bergman (DEP) (Nov. 15, 2013).

- Solvay is willing to assume responsibility for the operation and maintenance of POETs that were installed to address PFAS contamination attributable to the West Deptford Facility, as confirmed by Solvay's LSRP and listed on Exhibit E, assuming that DEP promptly shares with Solvay all necessary information to effectuate this transition. At this time, Solvay is not assuming responsibility for a number of the POET systems identified in paragraph 64 in reliance on the site remediation program regulations on the scope of a responsible party's investigation, the professional judgment of Solvay's LSRP, and the complete lack of information or other support from DEP for connecting the relief it seeks regarding the additional POET systems over such a broad area to any discharge from the West Deptford Facility;

- Solvay is willing, within 90 days of receiving the Directive, to confirm that it has identified and sampled all potable wells within 500 feet down gradient, 500 feet side gradient and 250 feet up gradient of each potable well listed on Exhibit E [*id.* ¶ 64(c)];

- Solvay is willing, within 120 days of receiving the Directive, to implement any treatment or monitoring for any additional potable wells with PFNA MCL or PFOA action level exceedances shown to be attributable to the West Deptford Facility under *Dimant* [*id.* ¶ 64(d)]; and

- Solvay is willing to submit an updated Remediation Cost Review and Remediation Funding Source/Financial Assurance Form to include the cost of additionally required potable well sampling and implementation of treatment and monitoring, if any [*id.* ¶ 65].[14]

Solvay's willingness to undertake these actions is ***a reiteration of*** Solvay's previous commitment to complete the investigation and remediation of PFAS impacts attributable to the West Deptford Facility. Solvay is not, in any way, deviating from that commitment.

Moreover, while the DEP has not asked this of Solvay, and Solvay is not obligated by law to do so, Solvay has already initiated a project to develop and validate analytical capabilities

[14] Solvay already has put its insurers on notice of the Directive. [Directive ¶ 76.]

to identify West Deptford replacement surfactants in the environment. Solvay would be happy to discuss this project with DEP at an upcoming meeting.

CONCLUSION

Based on the available information, Solvay objectively and reasonably believes that it has good cause defenses to the Directive. Nonetheless, Solvay is willing to comply with the Directive as set forth above. Moreover, Solvay looks forward to receiving the information and data relied upon by DEP in issuing the Directive and meeting with DEP to discuss impacts attributable to the West Deptford Facility, versus other sources, and a path forward that appropriately acknowledges the practical reality that Solvay is not responsible for impacts attributable to others.

Solvay reserves the right to amend or supplement this response hereafter if other or further information becomes available or relevant which makes such amendment or supplementation necessary or appropriate.

Sincerely,

Christopher M. Roe
Fox Rothschild LLP

Kegan A. Brown
Latham & Watkins LLP

CMR:stj

Enclosures:

Exhibit A: Table 1. PFAS Investigation Work Plans and Reports Prepared by Solvay and Submitted to NJDEP since 2013; Table 2. Summary of Environmental Samples Collected by Solvay as Part of the PFAS Investigation at West Deptford, NJ between 2013 and 2019.

Exhibit B: Summary Report on Potential Sources of PFAS, Gloucester County New Jersey, May 2018 (behind May 24, 2018 Letter M. Gertz to E. Bergman).

Exhibit C: Solvay's Response to Request for Information ¶ 68.

Exhibit D: Solvay's Response to Request for Information ¶ 69 – Contains Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

Exhibit E: List of POETs Installed by NJDEP to Address PFNA Potentially Attributable to the West Deptford Facility Per LSRP.

Exhibit F: Table 1. Key Agency Communications on Air Modeling for the PFAS Investigation at West Deptford, NJ, 2013 to 2015.

Exhibit F.1: Copies of Key Air Modeling Communications.

Exhibit G: West Deptford Replacement Surfactants Spreadsheets – Contains Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

Exhibit H: West Deptford Replacement Surfactants Safety Data Sheets – Contains Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

Exhibit A

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit A

Table 1. PFAS Investigation Work Plans and Reports
Prepared by Solvay and Submitted to NJDEP since 2013;

Table 2. Summary of Environmental Samples Collected by Solvay
as Part of the PFAS Investigation at West Deptford, NJ between 2013 and 2019

Exhibit A

Table 1. PFAS Investigation Work Plans and Reports Prepared by Solvay and Submitted to NJDEP since 2013.

Investigation Program	Submission Title	Submission Date	Description of Data and Reporting
Work Plan	2013 Workplan	11/15/2013	Initial workplan, includes QAPP, HSP, FSP, and Air Modeling Plan
	Addenda to 2013 Workplan, Field Sampling Plans (FSPs) for Public Water Systems (PWSs)	11/25/2013	Sampling plans for each of 7 PWS facilities: East Greenwich, Greenwich, National Park, Paulsboro, Westville, and Woodbury; each includes site-specific HSP & FSP
	2015 Work Plan	9/22/2015	Plan to continue investigation activity, includes QAPP and FSP
	Technical Memorandum: Proposed RI Activities	5/18/2018	Includes proposed sample locations summarized in tables and maps
Operational History	Letter from T. Buggey (Roux Associates) to E. Bergman (DEP) Re: Perfluoroalkyl Compound Usage	11/15/2013	LSRP submission to NJDEP; summary table of Surflon® and NaPFO estimated annual usage and emissions at the Solvay Plant in West Deptford, NJ, 1991-2012
Onsite and Offsite Groundwater Monitoring Wells	Groundwater Monitoring Data and May 7, 2014 Presentation Material	5/14/2014	LSRP submission to NJDEP; summary table and figure, EDD, laboratory report, and data validation report; Microsoft ® Power Point slides presented by Solvay at NJDEP meeting
Private Potable Wells	Solvay Private Potable Well Investigation (Contains Confidential Residential Information)	6/19/2014 - 10/28/2018	Eight consecutive rounds of sampling by Solvay of private potable wells; reported as summary tables and map, EDD, laboratory report, and data validation report
Immediate Environmental Concern (IEC)	IEC response Action Form 60 Day Response 120 Day Response 1 Year IEC Source Control Report	12/9/2015 1/26/2016 3/22/2016 12/7/2016	LSRP submissions to NJDEP
Public Water System (PWS) Wells	Quarterly Data Reports	12/3/2013 - 1/14/2015	LSRP report of results of quarterly sampling by Solvay of PWS wells at E. Greenwich, Greenwich, National Park, Paulsboro, West Deptford, Westville, and Woodbury. Greenwich Township declined a fourth round of sampling. Each submission includes a summary table and map along with an EDD, laboratory report, and data validation report.
	Paulsboro PWS Monthly Sampling – Summary Data Report for PFCs, December 2014 to May 2015	8/5/2015	Monthly sampling by Solvay at Paulsboro PWS from December 2014 to May 2015. Summary table, EDDs, laboratory reports, and data validation reports.
Summary Data Report (2015)	Summary Report: PFC Investigations Conducted by Solvay Specialty Polymers USA, LLC, West Deptford, NJ	3/3/2015	Summary tables and figures for samples collected from surface water, sediment, and pore water in the Delaware River, including discussion of results and conclusions
	Appendix A: Results of the Temporary Well Point Investigation	3/3/2015	Summary tables and figures, EDD, laboratory report, and data validation report, including discussion of results and conclusions
	Appendix B: Delaware River Surface Water and Sediment Data Report	3/3/2015	Summary tables and figures, EDD, laboratory report, and data validation report, including discussion of results and conclusions
	Appendix C: Air Modeling Report for Perfluoroalkyl Compounds	3/3/2015	Summary of approach and findings, plus model input and output files for reproducibility; including discussion of results and conclusions

Exhibit A

Table 1. PFAS Investigation Work Plans and Reports Prepared by Solvay and Submitted to NJDEP since 2013.

Investigation Program	Submission Title	Submission Date	Description of Data and Reporting
Summary Data Report (2017)	Perfluoroalkyl Compound Investigation Report	6/30/2017	Summary tables and figures for samples collected from onsite and offsite soil and groundwater; and surface water, sediment, and pore water from the Main Ditch and Little Mantua Creek
Other Sources	Letter from Solvay to NJDEP with Attachment entitled "Likely Third Party Sources of PFNA in the Delaware River Watershed and the Environment in and near Gloucester County, NJ	10/22/2015	Specific examples of evidence that there are likely multiple sources that released PFNA and other PFAS to the environment
	Summary Report on Potential Sources of PFAS, Gloucester County, NJ	5/24/2018	Specific examples of evidence that there are likely multiple sources that released PFNA and other PFAS to the environment

Notes:

EDD = electronic data delivery
FSP = field sampling plan
HSP = health and safety plan
IEC = immediate environmental concern
NaPFO = sodium perfluorooctanoate
NJDEP = New Jersey Department of Environmental Protection
PFAS = per- and polyfluoroalkyl substance
PFC = perfluoroalkyl compound
PWS = public water system
QAPP = quality assurance project plan
RI = remedial investigation

Exhibit A

Table 2. Summary of environmental samples collected by Solvay as part of the PFAS investigation at West Deptford, NJ between 2013 and 2019.

Sample Type	Number of Locations Sampled	Number of Samples[1]
Drinking water from Private Potable Wells	98	112
Drinking water from Public Water System (PWS) Wells	7 PWS	280
Groundwater from Monitoring Wells	124	216
Groundwater from Temporary Well Points	11	48
Groundwater from Onsite Recovery Wells	4	4
Surface Water	40	40
Sediment	32	79
Porewater	16	16
Soil	50	228
Total	382	1,023

[1] Excludes QA/QC samples, such as field duplicates.

Exhibit B

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit B

Summary Report on Potential Sources of PFAS, Gloucester County New Jersey, May 2018 (behind May 24, 2018 Letter M. Gertz to E. Bergman)

Public Inspection Copy
Exhibit B

Via Hand Delivery at May 24, 2018 Meeting
Ms. Erica Bergman
New Jersey Department of Environmental Protection ("NJDEP")
401 East State Street – Mail Code 401-05
P.O. Box 420
Trenton, NJ 08625-0420
Erica.Bergman@dep.nj.gov

Re: Solvay Specialty Polymers USA, LLC ("Solvay")
SRP PI #015010
Activity Number RPC140002

Dear Erica:

In previous meetings, the Department indicated that it would welcome and consider any information that Solvay Specialty Polymers USA, LLC could provide on other potential sources of perfluoroalkyl substances ("PFAS") to the environment in Gloucester County and the Delaware River. The purpose of this letter is to convey such information. As is clear from the documented presence of branched chain PFNA in sampling conducted by Solvay, there is no question that there are other sources of PFAS, including of PFNA, in the area that Solvay has investigated so far.

It is also clear from the data gathered that PFAS at parts per trillion levels are nearly ubiquitous in the local environment. The Department will need information and action from other sources in order to pursue its stated goal to have exceedances of the final groundwater quality criterion for PFNA investigated and addressed.

Attached is a *Summary Report on Potential Sources of PFAS, Gloucester County, NJ*, prepared by Integral Consultants, Inc. at Solvay's request. This report provides the Department with a summary of specific and general information that Solvay and Integral have compiled regarding potential sources. Solvay strongly urges the Department to thoroughly review and follow-up on the information in the attached report to require information, including sampling, from other potential sources in the immediate area of the Solvay plant.

Because of the importance of the Department obtaining information from other sources, Solvay respectfully requests a follow-up meeting on or about June 24, to discuss the attached Report, as well as the Department's planned and completed efforts to compel information from other potential sources. Please let us know if June 24 would work or whether the Department would prefer another date and time.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

SOLVAY

Sincerely,

Mitchell Gertz
HSE Compliance Manager

Enclosure: *Summary Report on Potential Sources of PFAS, Gloucester County, NJ*, Integral Consultants, Inc., 2018.

Public Inspection Copy
Exhibit B

SUMMARY REPORT ON POTENTIAL SOURCES OF PFAS

Gloucester County, New Jersey

Prepared for
Solvay Specialty Polymers USA, LLC
10 Leonard Lane
West Deptford, NJ 08086

Prepared by

923 Haddonfield Road
Suite 300
Cherry Hill, NJ 08002

May 24, 2018

CONTENTS

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AOC	area of concern
AFFF	aqueous film forming foam
ARFF	aircraft rescue and firefighting
BP	British Petroleum
CRTK	community right-to-know
DGW	discharge to groundwater
DSG	discharge to surface water
ECF	electrochemical fluorination
ECRA	Environmental Cleanup and Responsibility Act
EI	environmental indicator
FOIA	Freedom of Information Act
GCUA	Gloucester County Utilities Authority
GGB	GGB Bearing Technology
HSWA	Hazardous and Solid Waste Amendment
Hunstman	Huntsman Polypropylene Corporation
Integral	Integral Consulting Inc.
ISRA	Industrial Site Recovery Act
LSRP	Licensed Site Remediation Professional
Matteo	Matteo & Sons
NAICS	North American Industry Classification System
NFA	no further action
NJDEP	New Jersey Department of Environmental Protection
NJEMS	New Jersey Environmental Management System
NJPDES	New Jersey Pollution Discharge Elimination System
NPL	National Priority List
OPRA	Open Public Records Act
PFCs	perfluoroalkyl compounds
PFAS	perfluoroalkyl substance(s)

PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
Poly Rez	Polyrez Company
PRM	Potomac-Raritan-Magothy aquifer
PTFE	polytetrafluoroethene (Teflon ®)
RC-GCFA	Rowan College-Gloucester County Fire Academy
RCRA	Resource Conservation and Recovery Act
Shell	Shell Chemical Corporation
SIC	Standard Industrial Classification
Solvay	Solvay Specialty Polymers USA, LLC
SRP	Site Remediation Program
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency
WWTP	wastewater treatment plant

1 INTRODUCTION

This report presents the results of an investigation of potential sources of perfluoroalkyl substances (PFAS), including perfluorononanoic acid (PFNA), that have been detected in groundwater in the Delaware River Basin in the vicinity of the Solvay Specialty Polymers USA, LLC site in West Deptford, New Jersey (Solvay Plant). This report provides specific examples of evidence that there are likely multiple sources that released PFNA and other PFAS to the environment. Sampling conducted by Solvay clearly demonstrates the presence of branched isomers of PFNA in multiple samples and locations and the presence of anomalous PFAS and PFNA levels at locations not consistent with migration from the Solvay Plant.

This report supplements previous information on potential sources and data submitted to the New Jersey Department of Environmental Protection (NJDEP)[1]. Solvay continues to urge NJDEP to take the actions necessary to identify the sources and begin to investigate them. We believe that, together, the public information and documents we have gathered and the empirical data demonstrate conclusively the existence of other sources of PFAS releases to the environment. These additional sources need to be identified and investigated by NJDEP if it seeks to develop an effective mitigation strategy to address pathways by which PFAS is released to groundwater in New Jersey.

Information on individual sites presented in this report was gathered from local, state, and federal records databases, internet searches, and a review of public data associated with specific industry codes. In addition, empirical data summarized in the *Perfluoroalkyl Compound Investigation Report* submitted to NJDEP (Integral 2017a) was also considered to assess potential sources of PFAS within the Delaware River Basin.

As presented in the *Perfluoroalkyl Compound Investigation Report* (Integral 2017a), isomer chemistry in conjunction with substantial data on groundwater flow provide important lines of evidence of other sources. **In particular, the presence of branched PFNA isomers detected in groundwater samples demonstrates conclusively that there are sources of PFNA and other PFAS that are not related to Solvay.**

In fact, there are numerous potential sources in Gloucester County of linear and branched PFNA including facilities that manufacture and use polytetrafluoroethene (PTFE) and fluoroelastomer products (related to gasket/seal design, testing and manufacturing industries), historic aqueous film forming foam (AFFF) use (industrial operations, refineries and fire training areas), fluorochemical facilities (manufacturing), and petrochemical facilities (refining

[1] Examples of data submitted to NJDEP that provides evidence of multiple sources of PFNA include: 1) Integral (2015b; 2) Integral (2015a) [See Appendix A, Figures A-1 (Selected Industrial Facilities within the Delaware River Watershed), A-2 (NJPDES Surface Water Discharge Locations in the Delaware River Watershed), and A-3 (USACE Confined Disposal Facilities for Channel Deepening and Maintenance)]; and 3) Integral (2017b).

operations). Some of these companies/operations that were evaluated, such as Air Products, hold fluorochemical product patents and others conducted fire prevention training events. In some cases, documentation is available confirming that AFFF was used in large quantities in response to fires and spills. Although not discussed in specific detail in this document (e.g., individual municipal landfills are not identified as examples but are included on Figure 1), it should be noted that landfills and wastewater treatment plants (WWTPs) are present in the area in which PFAS sampling has occurred and these types of facilities are well documented potential sources of PFNA and other PFAS (Benskin et al. 2012; Järnberg et al. 2011; Lang et al. 2017). This report identifies several facilities that fit within the activities and/or industry categories above that are likely sources of PFAS compounds found in groundwater. Figure 1 includes the locations of facilities discussed as well as several other petrochemical, manufacturing, bulk storage/refining, and landfills located proximate to the Solvay site.

This report is divided into five sections. Section 2 describes how information regarding sites was collected and Section 3 includes a description of relevant information on several example sites. Sections 4 and 5 present the conclusions and a summary of reference materials used as part of the process of gathering information on potential sources of PFAS.

2 INFORMATION GATHERING

The following presents a summary of the sources used to identify and research potential sources of PFAS proximate to the Solvay site that may have released PFAS to the environment.

2.1 OPEN PUBLIC RECORDS ACTS

Open Public Records Act (OPRA) requests were submitted to local municipalities and the NJDEP for information on incident reports (e.g., response to spills, fires, etc.), current and historical community right-to-know (CRTK) reports to determine if PFAS were listed or suspected from chemical descriptions provided on CRTK reports, and general facility history. Specifically, the requests were made to identify any information related to the use, storage, spillage, and handling of materials containing PFAS. Because there have not been specific reporting requirements for PFAS, records of PFAS analytical chemistry measurements related to any of these activities were not produced. Nevertheless, other lines of evidence are available. As noted below, information that is available on reported chemicals and known or suspected manufacturing processes indicates that one or more products in fact likely contained PFAS.

2.2 FREEDOM OF INFORMATION ACT

Freedom of Information Act (FOIA) requests were submitted to the U.S. Environmental Protection Agency (EPA) for sites regulated by the EPA. In addition, a FOIA request was filed with the EPA related to publication EPA/600/R-09/033 (USEPA 2009) to obtain detailed information on trade names regarding PFAS in articles of commerce. Relevant articles of commerce include common household products that may be disposed in municipal landfills including but not limited to household carpet/fabric care products, treated apparel, textiles and upholstery, and treated food contact paper.

2.3 INTERNET-BASED INTELLIGENCE GATHERING

To supplement OPRA and FOIA requests, Integral Consulting Inc. (Integral) conducted internet searches to obtain information regarding the ownership and operational history of facilities, to review aerial photographs to assess operations, and to research potential incident/spill response actions. In addition, where available, EPA facility fact sheets and Resource Conservation and Recovery Act (RCRA) environmental indicator status reports were also searched. Integral also conducted on-line searches using the NJDEP online DataMiner resource, which provides information on the status of facilities within the NJDEP Site Remediation Program (SRP) framework (active/closed) and permits (e.g., New Jersey Pollution Discharge Elimination

System [NJPDES], water allocation, air) issued to the site owner/operator to assess potential pathways for release to the environment. As discussed in the remainder of this report, there is substantial evidence from public information to identify a wide range of facilities that may be historic and/or ongoing sources of PFAS in the Delaware River watershed.

2.4 NORTH AMERICAN INDUCSTRY CLASSIFICATION SYSTEM/STANDARD INDUSTRIAL CLASSIFICATIONS REVIEW

The North American Industry Classification System (NAICS) is a standard developed for use by Federal agencies to classify businesses for the purpose of analyzing and providing statistical data related to the U.S. manufacturing and business economy. The NAICS system was adopted in 1997 to replace Standard Industrial Classifications (SIC) to allow comparison across North American companies. Companies select their NAICS codes based on the primary business operation and there is no official rule for the selection of the code used. In order to use the NAICS codes to assess potential use of PFAS in product manufacturing or as a process aid, an evaluation of the industry is required. Examples of industries linked to products containing PFAS include automotive, aviation, and metal plating.

Based on statements made by the NJDEP at the June Site Remediation Advisory Group meeting and from NJDEP's responses to OPRA requests, it is clear that NJDEP has searched their New Jersey Environmental Management System (NJEMS) by NAICS code to identify potential sites in New Jersey for evaluation of PFAS. The search was limited to NAICS code 325211 (Plastics Material and Resin Manufacturing) and 313320 (Fabric Coating Mills). However, as identified by the NJDEP on their Contaminants of Emerging Concern website "Per- and Polyfluoroalkyl Substances (PFAS) have been used in a wide variety of industrial and commercial processes and products, including, but not limited to, electroplating and metal finishing (i.e., chromium plating), vapor/mist suppression, stain repellants, electronics, aerospace, automotive, insecticide/herbicides, adhesives/varnish/paints, as well as coatings for textiles such as fabric, rug, and paper." As PFAS use occurs in a wide variety of manufacturing sectors a review of additional NAICS codes is useful to identify potential sites that used or manufactured products that contain PFAS. In addition to NAICS codes 325211 and 313320, the following six NAICS codes are relevant because sites would be expected to use PFAS in manufacturing or as part of firefighting efforts:

NAICS Code	Description	Example Site
332991	Ball and Roller Bearing Manufacturing	GGB Bearing Technology
325120	Industrial Gas Manufacturing	COIM/Air Products

324110	Petroleum Refineries	PBF Energy
922160	Fire Protection	Rowan College – Gloucester County Fire Academy
423930	Recyclable Material Merchant Wholesalers	Matteo & Sons Superfund Site
488999	All Other Support Activities for Transportation	Eagle Point

3 EXAMPLE SITES

Multiple lines of evidence indicate that the sites discussed in this section may have contributed PFAS to the watershed based on historic uses of AFFF and/or PFAS in the manufacturing process. This report provides illustrative examples and is not intended to be an exhaustive summary of every site that has contributed PFAS to the watershed. The examples discussed here show that PFAS, including PFNA, releases are likely not limited to the Solvay site and that a more comprehensive effort by the NJDEP to identify both current and historical activities at facilities proximate to the Solvay Plant is warranted.

3.1 FIRE TRAINING AREAS

3.1.1 Rowan College Gloucester County Fire Academy

The Rowan College-Gloucester County Fire Academy (RC-GCFA) comprises approximately 18 acres located at 200 Shady Lane, East Greenwich Township (Clarksboro), NJ. The site is located approximately 2.6 miles southwest of Solvay's Plant (Figure 1). Based on a review of historic aerial photographs, this location has been used for fire-fighting training activities for at least 20 years.

The NJDEP Site ID for the facility is 382828 and the facility has been issued permits under the Air and Water Allocation programs. There is no historic or current SRP program interest number associated with the Site ID, indicating that there is no history of environmental investigation.

This site is used to practice and train for fire suppression events including aircraft rescue firefighting. It is very likely that AFFF was used in training activities to address fires involving hydrocarbons and other fuels. In fact, Integral has reviewed photographs from the RC-GCFA that show that significant amounts of firefighting foam are applied to the ground as part of its normal training operations.

In addition, groundwater data from approximately 1,250 ft away from the RC-GCFA included branched isomers of PFNA, and the presence of perfluorooctanesulfonic acid (PFOS), both of which are not associated with a release emanating from the Solvay site, and PFAS at this location is not consistent with groundwater migration from the Solvay facility (i.e., south/southeast).

The empirical evidence that AFFF use can contribute to PFNA in the environment is reported in the literature as well as investigation reports submitted to NJDEP for Department of Defense facilities located in New Jersey. For example, analytical results for samples collected from Joint

Base McGuire-Dix-Lakehurst (Department of the Air Force 2016) shows that PFNA is present in soil, sediment, surface water, and groundwater.

PFNA in residual AFFF can be related to the following:

- AFFF formulation method, including telomerization or electrochemical fluorination (ECF);
- Formulation mixtures of precursors that may degrade to PFNA as a terminal end product (Place and Field 2012); and
- Environmental conditions that promote oxidation of AFFF.

A study by Houtz et al. (2013) used an oxidative assay to determine if PFNA (and other PFAS) could be produced by *in situ* transformation of the fluorinated compounds present in various AFFF formulations. The study demonstrates that all four telomerization-based AFFFs studied (i.e., Ansul, Buckeye, Chemguard, and National Foam) produce PFNA upon oxidation. PFNA was not detected in any of the ECF formulations, such as the AFFF produced by 3M Company. Only formulations produced after 1988 were tested, so the study is inconclusive for earlier ECF-based formulations.

Since AFFF can contain PFNA or compounds that can transform into PFNA, it is reasonable to assume that PFNA is associated with the use of AFFF at sites located in Gloucester County. Therefore, by extension, historical use of the AFFF at the RC-GCFA facility likely contributed to PFNA releases to the environment.

3.1.2 Huntsman Polypropylene Corporation Facility

While a facility dedicated to fire training activities is an obvious source of PFAS in the environment, attention should be called to industrial facilities where fire training activities were conducted as part of routine site operations. The former Huntsman Polypropylene Corporation (Huntsman) facility was located on a 300-acre parcel of land on Mantua Grove Road, in West Deptford Township (USEPA Facility ID NJD00282602) and fire training activities were documented to be conducted at the facility (EPA RCRA EI) by Huntsman and their predecessor at that location.

Huntsman manufactured polypropylene at the site until 1999. Prior to Huntsman, the site was owned by Shell Chemical Corporation (Shell) who conducted similar operations at the site from 1962 to 1987. Shell conducted investigation activities under the NJDEP Environmental Cleanup and Responsibility Act (ECRA) including soil and groundwater sampling and hot spot removal of impacted soil. Shell received an NFA from the NJDEP in 1992.

As part of the site closure investigation conducted in 1999 under the Industrial Site Recovery Act (ISRA), successor program to ECRA, Huntsman identified various areas of concern (AOCs) for review and evaluation. This evaluation included the identification and subsequent investigation of AOC-L Fire Training Area. According to the RCRA RI, the AOC consisted of a steel pan and circular pit, which was used to hold hydrocarbons that were ignited for fire suppression training. While the area was investigated and remediated for hydrocarbon releases, no mention is made with respect to investigation of AFFF or other fire suppressant agents used in the training exercises. This training area would have been used for over 30 years and warrants further evaluation, especially since the site is located adjacent to Mantua Creek and run off from fire suppression training could have easily reached surface water.

In addition, from 1962 to 1972, facility chemical and sanitary sewers drained to an onsite treatment plant with effluent discharged directly to the Delaware River. For a period of time (1972–1975), effluent discharged to Mantua Creek. From 1975 until cessation of operations by Huntsman, effluent was discharged to the Gloucester County Utilities Authority (GCUA).

3.1.3 Philadelphia International Airport

The Philadelphia International Airport is served by Philadelphia Fire Department Station 78 for aircraft rescue and firefighting (ARFF). The station has been located on airport property at the current location since 1987.

According to the call signs for emergencies at the airport, three crash response vehicles (call signs - Foxtrot 6, Foxtrot 7, and Foxtrot 8) were equipped to carry 3,000 gal of water, and 420 gal of AFFF foam concentrate (Philadelphia International Airport Operational Procedure #30, June 2009). Maps included in the Operational Procedure show the location of the ARFF Training Facility and the ARFF Station adjacent to the Delaware River. Again, given the presence of an ARFF training facility and from direct responses to emergency situations, emergency response and historic training activities are likely sources of PFAS. This would not only include discharges to the surface, which is the recharge area for portions of the Potomac Raritan Magothy (PRM) aquifer system, but also to the Delaware River as a result of direct surface runoff (including discharges from storm drains).

3.2 MANUFACTURING

Two sites are presented below that have indicated current or past potential use of PFAS in the manufacturing process.

3.2.1 GGB Bearing Technology

GGB Bearing Technology (GGB) operates two facilities located at 700 Mid Atlantic Parkway (Thorofare I) and 1414 Metropolitan Avenue (Thorofare II), West Deptford (Thorofare), Gloucester County, NJ (www.ggbearings.com/en).

The Thorofare I facility has operated since 1976. This location produces metal-polymer bearings for use in the automotive, general industrial, and aerospace industries. The Thorofare II facility has operated at that location since 2015 and produces fiber reinforced composite bearings, busing blocks, and high precision assemblies for the agricultural, construction, marine, and hydro and fluid power industries. Prior to relocation to a larger building in the Mid Atlantic Industrial Center, the Thorofare II operations were located at 1413 Metropolitan Avenue. Both historic and current GGB Thorofare I and Thorofare II operations are located approximately ¾ mile southeast of Solvay's Plant (Figure 1). NJDEP DataMiner currently lists the following information with respect to regulatory programs:

- 700 Mid Atlantic Parkway (Thorofare I): Site ID 14640; SRP PI 015833 (all case numbers closed). This facility location is also regulated in the Air and Water Quality (NJPDES) Programs.
- 1413 Metropolitan Avenue: Site ID 39740; SRP PI G000042869 (for ISRA closure of 1451; remedial action objective issued by Robert L. Carter).
- 1414 Metropolitan Avenue: There is no NJDEP Site ID associated with this address.

Integral reviewed the CRTK reports submitted for the GGB sites. CRTK lists chemicals stored in various locations at the GGB Thorofare I site. CRTK documents prepared in 2016 include information that scrap Teflon (such as DP-4 Material) accumulates as waste in the processing area of the Thorofare I facility.

GGB discharges stormwater and industrial offgases under permits issued by the NJDEP. In addition, GGB also stores Teflon-containing waste materials for disposal. PFAS may have been released to soil from air dispersion and spills to the surface. PFAS also may have been released to surface water from surface runoff and/or stormwater discharges that contact surfaces that have been impacted by PFAS (e.g., roof leaders).

3.2.2 COIM/Air Products

The COIM/Air Products site (NJDEP PI 46026) is located at 675 Billingsport Road, Paulsboro, NJ, approximately 1.8 miles southwest of Solvay's Plant (Figure 1). The industrial facility, which appears unchanged since 1992, occupies approximately 7.5 acres southeast of the Valero and Paulsboro refining complexes.

The CRTK reports list dozens of chemicals stored in various containers at the COIM/Air Products site. One product, Surfynol-DF, is listed on several CRTK forms. Surfynol-DF is the tradename of a fluorinated chemical produced by Air Products (Järnberg et al. 2011). In addition, Air Products was awarded patents (US Patents: 5035841, 4657564, and 4020233) indicating it has long been involved in organofluorine chemical research and development.

According to NJDEP DataMiner records (NJDEP 2018), COIM/Air Products currently holds or has been historically issued a NJPDES Permit (NJ0004278) for the discharge of treated effluent to surface water (DSW activity class code) for discharge of sanitary and industrial wastes to groundwater (DGW activity class code). COIM/Air Products also holds a permit for land application of residuals, presumably biosolids (activity class code RES) from wastewater treatment. PFAS may be released to groundwater or surface water from untreated or partially treated industrial wastewater discharge. Furthermore, given the nature of the industrial operations at this facility, surface application of AFFF during fire training drills or emergency response to incidents also may have contributed to the release of PFAS to the environment.

In addition, groundwater samples collected from Paulsboro's public water supply wells located approximately 1 mile downgradient from the COIM/Air Products Paulsboro location included PFOS and branched isomers of PFNA, indicative of a source other than Solvay. Furthermore, the well locations are downgradient from COIM/Air Products, and not downgradient from the Solvay Plant.

3.2.3 Other Potential Industrial/Manufacturing Sources

The Colonial Seal Company is located at 1114 Crown Point Road in Westville, approximately 3 miles northeast of the Solvay facility. The company manufactures and distributes custom shaft seals, oil seals, hydraulic seals, and gaskets. According to the company website (www.colonialseal.com), the seals are available in high performance compounds including PTFE and Teflon®.

A search of the NJDEP DataMiner database for "Colonial Seal" did not provide any information regarding facility permits or other regulatory actions, which indicates that many smaller facilities may go unnoticed by the NJDEP in a search.

Additionally, the former Polyrez Company (Poly Rez) facility located at S. Columbia Avenue/Railroad Avenue in Woodbury, NJ, operated from 1950 to 1995. Historic operations varied from a production of plastics, phenolic resins, phenol formaldehyde coatings, elastomers and derivatives to, in later years under new ownership, the repackaging of halons, which are commonly used in fire suppression. Poly Rez has a long documented history of environmental incidents and discharges. This includes direct spills to surface water including a loss of 1,000 gal of phenol to Matthews Branch, a tributary to Woodbury Creek, and the discharge of sodium hydroxide and hydrochloric acid, to which the U.S. Coast Guard responded.

Environmental remediation activities included the removal of contaminated soil related to an underground storage tank used for heating fuel. The site was also cited by the Occupational Health and Safety Administration related to worker safety violations.

Additional operations/industries in the West Deptford area that may use PFAS and that conduct activities that are included as part of the NJDEP's identification of potential industries on their emerging contaminants website, but where details from intelligence gathering activities are limited, include:

- Lilly Industrial Coatings (West Deptford, NJ), which manufactured coatings (e.g., adhesives, varnish, paints).
- HPS, Inc. (West Deptford, NJ), a design and testing facility for precision gaskets and seals.
- Automatic Plating – Accu-Cote (Accu-Cote Inc), a steel and aluminum electro coating, dipping, wrapping, and painting, and plating service company.

3.3 REFINING OPERATIONS AND BULK STORAGE

Fire suppression training and incident response are conducted throughout the operating history of refining and bulk storage operations. Based on the operating age of and the type of fuels and petrochemicals produced and stored at these locations it is highly likely that firefighting foam is currently (for active facilities) and historically stored onsite and used in fire suppression incidents.

As previously discussed in Section 3.1, there is clear empirical evidence that AFFF use can contribute to PFNA in the environment.

Therefore, by extension, historical use of AFFF at the Eagle Point Refinery Complex, the PBF Energy Facility, and other refinery complexes in the region may well have contributed to PFNA discharges to the environment. Summaries of the Eagle Point Refinery and PBF Energy Facility, including documented use of AFFF where available, are presented below.

3.3.1 Eagle Point Refinery

The Sunoco Partners Marketing and Terminals, L.P., facility, a/k/a Eagle Point Refinery comprises approximately 1,000 acres located on the Delaware River waterfront at 1250 Crown Point Road (Route 295&130), West Deptford, NJ. The refinery is located approximately 3 miles east-northeast of Solvay's Plant (Figure 1).

The refinery is regulated within the NJDEP SRP under the following case and site identification numbers: Site ID: 15834; SRP ID: 003724 (Sunoco Partners Marketing and Terminals); Licensed Site Remediation Professional (LSRP): Gary A. Angyal (Coastal Eagle Point Site Wide Remediation); and under Hazardous and Solid Waste Amendment (HSWA) Permit No. NJD990753162 (USEPA 2008).

Two incidents of fires at the facility were documented in the OPRA files (July 26, 1989 and July 11, 2007) and indicated that foams were used as part of fire suppression activities. In addition to the incidents reported to the NJDEP and included in the file review, the Contingency Plan prepared for the site included the storage of two foam trailers containing XL-3 foam, which is a fluoroprotein foam concentrate used to extinguish fires in hydrocarbon fuels.

PFAS would be released to the surface from direct application of AFFF during training and response activities (Oland 2008). This release would impact soil, groundwater, and potentially direct discharge to surface water unless proper spill control measures are in place to prevent this scenario from occurring (e.g., placement of berms to contain AFFF and prevent migration to stormwater features or direct discharge to surface water) (FFFC 2017).

In addition, groundwater samples collected from public water supply wells for the City of Woodbury located approximately 1.5 miles downgradient of the Eagle Point Facility included PFOS and branched isomers of PFNA, indicative of a source other than Solvay. These wells are not downgradient from the Solvay Plant.

3.3.2 PBF Energy

The PBF Facility comprises over 650 acres located on the Delaware River waterfront within Greenwich Township, NJ. PBF is located approximately 2 miles southwest of Solvay's Plant (Figure 1). The refinery has been in operation for over 60 years. In addition to refining and manufacturing operations, the site includes bulk storage tanks, pipelines, railways, and port areas for bulk delivery and product shipment (PBF 2015).

The PBF Refinery is regulated within the NJDEP SRP under the following case and site identification numbers: Site ID: 14376; SRP ID: 157002; LSRP: Nicholas DeRose.

During February 2012, following the release of more than 6 million gal of fuel oil due to a catastrophic tank failure, foam was applied for odor control. Photographs of the incident including foam application were released through news reports.

PBF is permitted to discharge treated industrial wastewater to the Delaware River. PBF is also permitted to discharge stormwater under a NJPDES permit. PFAS would be released to the surface from direct application of AFFF during training and response activities. This release would impact soil, groundwater, and potentially direct discharge to surface water (unless proper spill control measures are in place to prevent such discharges).

In addition, groundwater samples collected from Paulsboro's public water supply wells located approximately ¾ of a mile downgradient from the PBF Energy Facility included PFOS and branched isomers of PFNA, indicative of a source other than Solvay. These wells are not located downgradient of the Solvay Plant.

Eagle Point Refinery and PBF Energy facilities are highlighted in this report as examples of local storage and fining operations that likely contributed PFAS, including PFNA, to the watershed. There are numerous other storage or refining operations in the West Deptford/ Paulsboro area, including:

- Colonial Pipeline Company and Gulf Oil LP, which operate transfer/storage terminals in West Deptford;
- Axeon Specialty Product LLC (located along Mantua Creek), which operates an asphalt refinery in Paulsboro; and
- British Petroleum (BP), which operated a terminal facility along Mantua Creek.

3.4 OTHER SITES

3.4.1 Matteo & Sons Superfund Site

The Matteo & Sons Superfund Site (Matteo) is located at 1708 US Highway 130 (Crown Point Road) in West Deptford, Gloucester County, NJ (Figure 1), approximately 2.3 miles northeast of the Solvay facility. The approximately 82 acre property was purchased by the Matteo family in 1947 and includes a scrapyard and an open field/waste disposal area. The Matteo family operated an unregistered landfill, junkyard and metals recycling at the site since 1961 and an active incinerator was identified at the site in 1968. Among other violations, inspections from the NJDEP identified lead sweating, landfilling, and household wastes along Hessian Run (a Delaware River tributary adjacent to the landfill). Matteo was listed on the National Priorities List (NPL) in September 2006 by EPA Region 2: EPA ID: NJD011770013; EPA Remedial Project Managers: Lawrence Granite and Thomas Dobinson (USEPA 2006).

The Matteo site operated as a landfill until 1984 and subsequent operations included a junkyard and metals recycling facility. A portion of the property is currently used for active metal salvaging. These types of operations are known to potentially contribute releases of PFAS, including PFNA, and other compounds to groundwater:

- ***Landfills*** – Numerous studies have demonstrated that landfill leachate can be an ongoing source of PFAS, including PFNA, loadings to watersheds (see Section 3.4.2).

- ***Chrome plating*** – The use of products containing PFNA and other PFAS for chrome plating operations was one of the exemptions from the Significant New Use Rules enacted by EPA. Therefore, under this exemption discharges from facilities that use or recycle these materials can contribute PFAS to the environment without documentation of their use under Toxic Substances Control Act (TSCA). For example, the source of high concentrations of PFOS in a WWTP was traced back to a large chrome plating operation that used a surfactant product and discharged to the WWTP (Kelly and Solem 2007).

Pathways for release of PFAS to the environment include soil and groundwater impacts associated with disposal and staging of scrap metals; and landfill leachate (groundwater and surface water pathway) from the improper disposal of household wastes along Hessian Run.

3.4.2 Landfills

Landfills are a likely source of PFAS, including PFNA, to both surface water and groundwater (OECD 2002; Kallenborn et al. 2004; Prevedourous et al. 2008; Woldegiorgis et al. 2006; Clara et al. 2008; Busch et al. 2010; Eggen et al. 2010; Huset et al. 2011; Benskin et al. 2012; Li et al. 2012; Clark et al. 2015; Lang et al. 2017). Depending on the type of landfill, PFAS may enter the waste stream through consumer products, industrial wastes, and sludge from WWTP operations. Leachate from unlined landfills may percolate into underlying groundwater or discharge into surface waterways. Lined, engineered landfills may also route leachate through an onsite treatment system or through a WWTP, both of which may not effectively remove PFAS.

Many landfills are present within the Delaware River watershed. An online search was conducted using the NJDEP landfill database (www.nj.gov/dep/dshw/lrm/landfill.htm; NJDEP 2015), NJDEP DataMiner (https://www13.state.nj.us/DataMiner; NJDEP 2018), USEPA Envirofacts database (www.epa.gov/enviro/ USEPA 2018), and a dataset of Pennsylvania municipal waste operations available from the Pennsylvania Department of Environmental Protection environmental mapping tool eMapPA (www.depgis.state.pa.us/emappa/; PADEP 2015). These sources provide information on approximately 150 landfills located within a 20 mile radius of the Solvay Plant.

Given the demonstrated association of PFNA to landfill leachates and the presence of numerous NPL-listed and other landfills across the watershed, it is reasonable to assume that many of the landfills are sources of PFNA to the Delaware River and the environment in and near Gloucester County.

4 CONCLUSIONS

The main objective of this report was to present information on potential sources of PFAS that we obtained from public sources, including NJDEP's online resources. There are a variety of types of industries located proximate to the Solvay site that may be sources of PFAS releases to the environment. This research identified several users of PFAS in manufacturing (e.g., GGB), an active user of AFFF during fire training activities (RC-GCFA), and incidents where AFFF was applied to mitigate odor or suppress fire (e.g., the tank failure at PBF Energy and the tank explosion at the Eagle Point Refinery).

This report is not intended to serve as an exhaustive list of potential sources, but rather to demonstrate that there are a variety of facilities and industries, as shown on Figure 1, located proximate to the Solvay Plant that should be further evaluated by the NJDEP as potential sources of PFAS to the environment. It appears that, to date, NJDEP has focused its information gathering efforts on only two NAICS codes. NJDEP should consider, at minimum, the facilities identified in this summary report and, more generally, should consider a wider set of activities and NAICS codes.

The data submitted to NJDEP and available from public sources, including NJDEP's online resources, provide compelling evidence that multiple sources of PFNA and other PFAS exist in the vicinity of the Solvay Plant. NJDEP cannot hope to understand and address the presence of PFAS in the environment without taking steps to identify and investigate other potential sources.

5 REFERENCES

Benskin, J.P., B. Li, M.G. Ikonomou, J.R. Grace, and L.Y. Li. 2012. Per- and polyfluoroalkyl substances in landfill leachate: Patterns, time trends, and sources. *Environ. Sci. Technol.* 46(21):11532-11540.

Busch, J., L. Ahrens, R. Sturm, and R. Ebinghaus. 2010. Polyfluoroalkyl compounds in landfill leachates. *Environ. Pollut.* 158:1467–1471.

Clara, M., S. Scharf, S. Weiss, O. Gans, and C. Scheffknecht. 2008. Emissions of perfluorinated alkylated substances (PFAS) from point sources-identification of relevant branches. *Water Sci. Technol.* 58(1):59–66.

Clark, B.O., T. Anumol, M. Barlaz, and S.A. Snyder. 2015. Investigating landfill leachate as a source of trace organic pollutants. *Chemosphere.* 127:269–275.

Department of the Air Force. 2016. Memorandum from Curtis Frye, P.E., Remediation Program Manager to Doug Pocze, USEPA Region 2 Remedial Project Manager, providing validated sample results for PFCs at Joint Base McGuire-Dix_Lakehurst. November 28. http://www.jointbasemdl.af.mil/PFCs/. Accessed on October 10, 2017.

Eggen, T., M. Moeder, and A. Arukwe. 2010. Municipal landfill leachates: A significant source for new and emerging pollutants. *Sci. Tot. Environ.* 408(21):5147–5157.

FFFC. 2017. Fact sheet on AFFF fire fighting agents. Available at: www.fffc.org. Accessed on October 12, 2017. Fire Fighting Foam Coalition, Arlington, VA.

Houtz, E.F., C.P. Higgins, J.A. Field, and D.L. Sedlak. 2013. Persistence of perfluoroalkyl acid precursors in AFFF-impacted groundwater and soil. *Environ. Sci. Technol.* 47:8187-8195.

Huset, C.A., M.A. Barlaz, D.F. Barofsky, and J.A. Field. 2011. Quantitative determination of fluorochemicals in municipal landfill leachates. *Chemosphere.* 82(10):1380–1386.

Integral. 2015a. Delaware River surface water and sediment data report. Samples collected August 19-28, 2014. Integral Consulting Inc. March 3.

Integral. 2015b. Summary Report. Findings of PFC investigation conducted by Solvay Specialty Polymers USA, LLC, West Deptford, NJ. Integral Consulting Inc. March 3.

Integral. 2017a. Perfluoroalkyl compound investigation report. Integral Consulting Inc.

Integral. 2017b. Personal communication (letter to USEPA Region 2, with copies to NJDEP, dated March 29, 2017, regarding PFAS detected at Matteo & Sons Superfund Site in New Jersey). Integral Consulting Inc.

Järnberg, U., K. Hölmstrom, B. van Bavel, and A. Kärrman. 2011. Perfluoroalkylated acids and related compounds (PFAS) in the Swedish environment. https://www.diva-portal.org/smash/get/diva2:657980/FULLTEXT01.pdf, Accessed on April 28, 2015.

Kallenborn, R., U. Berger, and U. Järnberg. 2004. Perfluorinated alkylated substances (PFAS) in the Nordic environment. TemaNord 2004:552. Nordic Council of Ministers, Copenhagen, Denmark. 112 pp.

Kelly, J., and L. Solem. 2007. Identification of a major source of perfluorooctane sulfonate (PFOS) at a wastewater treatment plant in Brainerd, Minnesota. Minnesota Department of Health, MN.

Lang, J.R., B. Allred, J. Field, J. Levis, and M. Barlaz. 2017. National estimate of per- and polyfluoroalkyl substance (PFAS) release to U.S. municipal landfill leachate. *Environ. Sci. Technol.* 51:2197-2205.

Li, B., M.N. Dannon-Schaffer, L.Y. Li, M.G. Ikonomou, and J.R. Grace. 2012. Occurrence of PFCs and PBDEs in landfill leachates from across Canada. *Water Air Soil Pollut.* 223:3365–3372.

NJDEP. 2015. New Jersey Landfill List, last updated December, 2014. www.state.nj.us/dep/dshw/lrm/landfill.htm. Accessed on March 20, 2015. Last updated on January 23, 2015. New Jersey Department of Environmental Protection, Division of Solid and Hazardous Waste, Trenton, NJ. December.

NJDEP. 2018. NJDEP DataMiner. https://www13.state.nj.us/DataMiner. Accessed May 2018. Last updated on March 17, 2016. New Jersey Department of Environmental Protection, Trenton, NJ.

OECD. 2002. Hazard assessment of perfluorooctane sulfonate (PFOS) and its salts. ENV/JM/RD(2002)17/FINAL. JT00135607. Available at: www.oecd.org/dataoecd/23/18/2382880.pdf. Organisation for Economic Co-operation and Development, Environment Directorate. 362 pp. November 21.

Oland, J. 2008. Fire protection engineer: Atmospheric storage tank fire protection (presentation for Sunoco dated September 19, 2008). Jeffrey Oland, P.E. Available at: http://sache.org/workshop/2008Faculty/files/FPPresentation.pdf

PADEP. 2015. eMapPA Municipal Waste Operation Dataset. www.depgis.state.pa.us/emappa/. Accessed on March 20, 2015. Pennsylvania Department of Environmental Protection, Geospatial Data Center, Harrisburg, PA.

PBF Energy. SEC Form K filing for year ending 2015. Available at: www.pfbfnergy.com. PBF Energy, LLC.

Place, B.J., and J.A. Field. 2012. Identification of novel fluorochemicals in aqueous film-forming foams (AFFF) used by the US Military. *Environ. Sci. Technol.* 46(13):7120-7127.

Prevedourous, K., I.T. Cousins, R.C. Buck, and S.H. Korzeniowski. 2006. Sources, fate, and transport of perfluorocarboxylates. *Environ. Sci. Technol.* 40(1):32-44.

USEPA. 2006. Matteo & Sons Superfund Site National Priorities List (NPL) Site Narrative. U.S. Environmental Protection Agency.

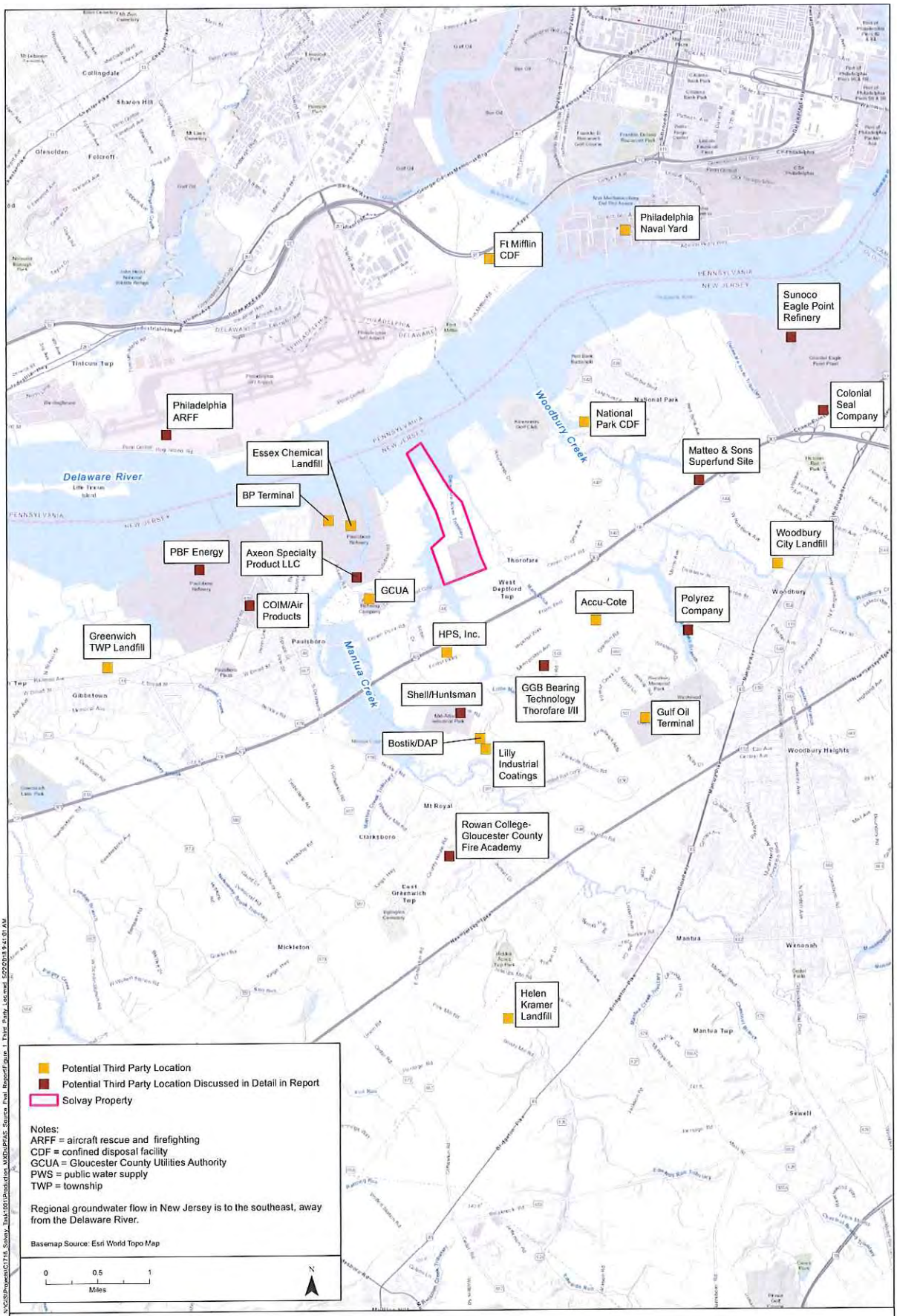
USEPA. 2008. Sunoco Incorporated R&M Eagle Point Refinery, Documentation of environmental indicator determination, Sunoco, Inc. (R&M) Eagle Point Facility. Available at: https://www3.epa.gov/region02/waste/sunoco725.pdf. U.S. Environmental Protection Agency.

USEPA. 2009. Perfluororcarboxylic acid content in 116 articles of commerce. EPA/600/R-09/033. U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Office of Research and Development, Washington, DC.

USEPA. 2018. Envirofacts database. www.epa.gov/enviro/. U.S. Environmental Protection Agency, Washington, DC.

Woldegiorgis, A., J. Anderson, M. Remberger, L. Kaj, Y. Ekheden, L. Blom, E. Brorström-Lundén, A. Borgen, C. Dye, and M. Schlabach. 2006. Results from the National Swedish Screening Programme 2005. Subreport 3: Perfluorinated alkylated substances (PFAS). IVL Report B1698. IVL Swedish Environmental Research Institute Ltd., Stockholm, Sweden. 48 pp. November 20.

FIGURES



integral

Figure 1.
Potential Third Party Location Map

Exhibit C

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit C

Solvay's Response to Request for Information Paragraph 68

Public Inspection Copy

Exhibit C -- Solvay Response to Information Request at Paragraph 68 of the Directive

Solvay hereby responds to the Information Request at Paragraph 68 of the Directive, as to historic uses of PFNA, PFOA and PFOS at Solvay's West Deptford Facility.

Each Respondent, as applicable, within 21 days of receipt of this Directive, shall provide the following information to the Department regarding its historic use of PFNA, PFOA and/or PFOS in New Jersey:

a. *Identify all PFNA, PFOA and PFOS manufactured, supplied, transported, stored, used, treated, disposed, and/or discharged in New Jersey;*

Solvay's Response:

This request calls for information previously provided to DEP.

Solvay did not manufacture PFNA, PFOA or PFOS in New Jersey. Solvay used Surflon®, which contains ammonium perfluorononanoate (PFNA) from late 1990 through 2010, and sodium perfluorooctanoate (PFOA) from 1995 through 2003, as processing aids in its manufacturing operations at 10 Leonard Lane, West Deptford, NJ ("West Deptford Facility"). Solvay has never used PFOS at the West Deptford Facility. In November 2013, Solvay, through its Licensed Site Remediation Professional, Thomas R. Buggey of Roux Associates, submitted to DEP information that, among other things, identified the products used at the West Deptford Facility that contained PFNA and PFOA. See the November 15, 2013 letter from Thomas R. Buggey, LSRP to Erica Bergman in the DEP Bureau of Case Management and the attached West Deptford Plant PFC Usage and Emissions spreadsheet ("November 2013 Submission").

b. *Identify the nature, extent, source and location of discharges of PFNA, PFOA and PFOS into the waters of the State;*

Solvay's Response:

During the period of Solvay's operation of the West Deptford Facility, Solvay did not discharge process waste water containing PFNA or PFOA into the "waters of the State," as that phrase is defined in the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-3t and the regulations thereunder including at N.J.A.C. 7:14A-1.2. Note that the masses provided in the "Water" columns in the West Deptford Plant PFC Usage and Emissions spreadsheet in the November 2013 Submission represent estimates of the masses emitted in the process waste water. They do not represent discharges to the "waters of the State."

In addition, since September 2013, Solvay has conducted an extensive investigation of the presence of these substances in the environment in the area in which the West Deptford Facility is located under the oversight of Solvay's LSRP and DEP. A summary table of the work plans and data reports related to this investigation is attached as Exhibit A to Solvay's Response to the Directive. *See* Table 1. PFAS Investigation Work Plans and Reports Prepared by Solvay and Submitted to NJDEP since 2013. The results of that work have been and will continue to be submitted to DEP, and that work is continuing.

c. *Identify the nature, extent, source and location of emissions of PFNA, PFOA and PFOS into air;*

Solvay's Response:

This request calls for information previously provided to DEP. See the November 2013 Submission.

In addition, since September 2013, Solvay has conducted an extensive investigation of the presence of these substances in the environment in the area in which its plant is located under the oversight of Solvay's LSRP and DEP. A summary table of the work plans and data reports related to this investigation is attached as Exhibit A to Solvay's Response to the Directive. *See,* Table 1. PFAS Investigation Work Plans and Reports Prepared by Solvay and Submitted to NJDEP since 2013. The results of that work have been and will continue to be submitted to DEP, and that work is continuing.

Beginning in September 2013, Solvay also initiated the development of an air dispersion model to understand historical emissions of perfluoroalkyl compounds from the West Deptford Facility. This model was developed with significant input and comments from both DEP and the United States Environmental Protection Agency. *See* Exhibit F to Solvay's Response to the Directive, Table 1. Key Agency Communications on Air Modeling for the PFAS Investigation at West Deptford, NJ, 2013 to 2015; Exhibit F.1 to Solvay's Response to the Directive, Copies of Key Air Modeling Communications. The results of the model were submitted to DEP in March 2015. *Air Modeling Report for Perfluoroalkyl Compounds*, March 3, 2015, Integral Consulting, Inc. The key conclusions of the report were that no significant amount of PFNA or PFOA emitted from Solvay operations would have been deposited beyond the West Deptford Facility property boundary and that depositions decreased significantly with distance from the facility. Solvay supplemented that report with information requested by DEP in September 2015, and has received no further input or comments from DEP on the results of that air dispersion modeling.

d. *if the respondent is not the manufacturer, supplier, or transporter of PFNA, PFOA and PFOS, identify any such manufacturer, supplier or transporter; and*

Solvay's Response:

This request calls for information previously provided to DEP. Solvay purchased Surflon® from Asahi Glass and purchased sodium perfluorooctanoate from 3M.

e. *the respondent's ability to pay for, or perform, the clean-up and removal of PFNA, PFOA and PFOS from New Jersey's environment, and every "change of ownership" (as defined in N.J.S.A. section 13: 1K-8) involving Respondents' current or former sites in New Jersey.*

Solvay's Response:

This request calls for information previously provided to DEP.

- As to Solvay's ability to pay for the investigation and remediation associated with the West Deptford Facility, Solvay has established and maintained a remediation funding source for this site since January 2017. Solvay updates this funding source as required by NJAC 7:26C.

- As to changes in ownership, this request calls for information previously provided to DEP by Solvay and prior owners of the plant through ECRA and ISRA processes.

    - In 1985, Pennwalt Corporation designed and built the current polyvinylidene fluoride plant in West Deptford, New Jersey. Pennwalt became Atochem North America, Inc. ("Atochem").

    - On October 31, 1990, Ausimont USA, Inc. purchased the plant from Atochem. It is Solvay's understanding that Arkema Inc. is a successor to liabilities of Pennwalt/Atochem for the West Deptford plant.

    - In 2002, Solvay acquired Ausimont USA, Inc. On January 1, 2003, Ausimont USA, Inc. changed its name to Solvay Solexis. Solvay Solexis operated the plant until it was merged into Solvay Specialty Polymers USA, LLC in 2012. Solvay Specialty Polymers USA, LLC has operated the plant since 2012.

    - The ISRA Case #'s for the plant are: E89231, E90205, 20020018.

Exhibit D

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit D

Redacted as Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

Solvay's Response to Request for Information Paragraph 69

Exhibit E

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit E

List of POETs Installed by NJDEP to Address PFNA
Potentially Attributable to the West Deptford Facility Per LSRP

Exhibit E

List of POETs Installed by NJDEP to Address PFNA Potentially Attributable to the West Deptford Facility Per LSRP

West Deptford Township, Gloucester County

1) Block 351, Lot 8.03, 963 Kings Highway; and
2) Block 351, Lot 8.01, 965 Kings Highway; and
3) Block 346.07, Lot 21.02, 643 Mantua Grove Road; and
4) Block 350.03, Lot 45, 1043 Kings Highway; and
5) Block 346.07, Lot 21.01, 619 Mantua Grove Road; and
6) Block 353, Lot 1.03, 350-352 Parkville Station Road; and
7) Block 354, Lot 1.03, 1098 Jessup Road.

Exhibit F

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit F

Table 1. Key Agency Communications on Air Modeling
for the PFAS Investigation at West Deptford, NJ, 2013 to 2015

And

Exhibit F.1

Copies of Key Air Modeling Communications

Exhibit F

Table 1. Key Agency Communications on Air Modeling for the PFAS Investigation at West Deptford, NJ, 2013 to 2015.

Item	Date	Participants	Description of Communication	Relevant Exhibit in this Letter
1	8-Oct-13	NJDEP[1] and Solvay[2]	NJDEP case manager, Erica Bergman, identifies NJDEP point of contact and expert on air modeling, Greg John, who Solvay should contact for guidance.	Exhibit F.1, Item 1
2	17-Oct-13	NJDEP[3] and Integral[4]	In a phone call with Solvay's air modeling expert at Integral, NJDEP conveys expectations for the goals and technical approach to PFAS air modeling and shares an example of PFAS air modeling conducted by NJDEP at another facility. NJDEP outlines its preferences for: 1) model software (AERMOD); 2) meteorological data source; 3) example inputs and assumptions; 4) model output.	verbal communication
3	15-Nov-13	NJDEP[1] and Solvay[2]	Solvay submits Air Modeling Plan as part of the PFAS project workplan.	By reference in Exhibit A, Table 1
4	7-Jan-14	NJDEP[3] and Integral[4]	NJDEP provides meteorological file to use for modeling using AERMOD.	Exhibit F.1, Item 4
5	10-Mar-14	NJDEP[3] and Integral[4]	Integral provides NJDEP with proposed complete set of inputs for modeling using AERMOD.	Exhibit F.1, Items 5 & 6
6	11-Mar-14	NJDEP[3] and Integral[4]	NJDEP recommends additional modeling run scenarios to address cumulative sources.	Exhibit F.1, Items 5 & 6
7	13-Mar-14	NJDEP[3] and Integral[4]	NJDEP and Integral discuss additional scenarios after which Solvay submits draft air modeling report.	verbal communication
8	31-Mar-14	NJDEP[1] and Solvay[2]	NJDEP coordinates review with USEPA and provides comments from USEPA on air modeling report submitted by Solvay.	Exhibit F.1, Item 8
9	9-Apr-14	NJDEP[1] and Solvay[2]	Solvay provides NJDEP with a response to comments.	Exhibit F.1, Item 9
10	10-Apr-14	NJDEP[1] and Solvay[2]	NJDEP indicates that USEPA finds 3 of 4 responses are adequate, and requests additional modeling to address simultaneous emissions from multiple point sources.	Exhibit F.1, Item 10
11	6-May-14	NJDEP[3] and Integral[4]	Integral provides NJDEP with additional input files and results of modeling to address comments received.	Exhibit F.1, Item 11
12	13-Jun-14	NJDEP[1] and Solvay[2]	NJDEP provides combined comments from NJDEP and USEPA, indicating partial fulfillment of Nov 2013 workplan. No deficiencies in approach are noted; but additional information is requested for reporting.	Exhibit F.1, Item 12
13	3-Jul-14	NJDEP[3] and Integral[4]	Integral coordinates teleconference with NJDEP to discuss proposed approach to address comments.	Exhibit F.1, Item 13
14	3-Mar-15	NJDEP[1] and Solvay[2]	Solvay submits PFAS investigation report that includes air modeling approach and findings.	By reference in Exhibit A, Table 1
15	10-Jun-15	NJDEP[1] and Solvay[2]	NJDEP and Solvay meet to discuss PFAS investigation report including air modeling approach and findings. NJDEP expresses overall agreement with air modeling methodology and conclusions, and indicates that minor comments are forthcoming.	verbal communication
16	31-Jul-15	NJDEP[5] and Solvay[2]	NJDEP provides written comments to Solvay on PFAS investigation report, including air modeling. NJDEP questions choice of model, scenarios evaluated, and inputs and assumptions that were applied.	Exhibit F.1, Item 16
17	22-Sep-15	NJDEP[1] and Solvay[6]	Solvay provides a response to comments received on July 31, 2015.	Exhibit F.1, Item 17

[1] Erica Bergman, NJDEP Bureau of Case Management.

[2] Mitch Gertz, Solvay Specialty Polymers, HSE Compliance Manager

[3] Greg John, NJDEP Division of Air Quality, Bureau of Technical Services

[4] Jim Lape, Integral Consulting, Senior Science Advisor - on behalf of Solvay.

[5] Steve Maybury, NJDEP Chief of Bureau of Case Management.

[6] Chuck Jones, Solvay, West Deptford Site Manager.

Exhibit F.1 – Item 1

From: Bergman, Erica <Erica.Bergman@dep.state.nj.us>
Date: Tue, Sep 10, 2013 at 3:43 PM
Subject: Solvay - 9/6/13 meeting powepoint
To: "Gertz, Mitchell (mitchell.gertz@solvay.com)" <mitchell.gertz@solvay.com>
Mitch,

Thanks for meeting with the Department to discuss the Solvay facility and investigation of PFNA. We appreciate Solvay working cooperatively with the Department and EPA on this issue. I don't have the public supply well location or data list from Safe Drinking Water yet, I will forward when I receive it. Regarding air modeling, I mentioned that DEP has an expert that you can contact for guidance. I told him that Solvay or a representative may be contacting him. His name is Greg John and he's in the Division of Air Quality, Bureau of Technical Services. 609-633-1106 or Greg.John@dep.state.nj.us .

Can you provide me with an electronic copy of your powerpoint presentation used at our 9/6/13 meeting? I'd like to share the powerpoint with others at DEP that attended the meeting, so please redact anything that Solvay finds necessary and state "confidential proprietary" on the email if required.

thanks, Erica

Erica Bergman

NJDEP - Bureau of Case Management
401 E. State Street - Mail Code 401-05
P.O. Box 420
Trenton, NJ 08625-0420
Erica.bergman@dep.state.nj.us
609-292-7406

Exhibit F.1 – Item 4

From: John, Greg [mailto:Greg.John@dep.state.nj.us]
Sent: Friday, January 17, 2014 12:03 PM
To: Jim Lape <jlape@integral-corp.com>
Subject: RE: Solvay Air Modeling

2008 -2012 Philadelphia met data for AERMOD version 12345.

Greg John
Research Scientist
(609) 633-1106

From: Jim Lape [mailto:jlape@integral-corp.com]
Sent: Tuesday, January 14, 2014 11:59 AM
To: John, Greg
Cc: mitchell.gertz@solvay.com; Philip Goodrum; S. Xiah Kragie
Subject: RE: Solvay Air Modeling

Thanks Greg. How about 10:30 am this Friday (1/17)?

Jim

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 13 | Cell: 410.897.7006 | Fax: 410.573.9746

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: John, Greg [mailto:Greg.John@dep.state.nj.us]
Sent: Monday, January 13, 2014 10:50 AM
To: Jim Lape
Cc: mitchell.gertz@solvay.com; Philip Goodrum; S. Xiah Kragie
Subject: RE: Solvay Air Modeling

I have some meetings on Thursday; anytime Friday is better for me.

Greg John
Research Scientist
(609) 633-1106

From: Jim Lape [mailto:jlape@integral-corp.com]
Sent: Monday, January 13, 2014 8:42 AM
To: John, Greg
Cc: mitchell.gertz@solvay.com; Philip Goodrum; S. Xiah Kragie
Subject: Solvay Air Modeling

Hi Greg:

Would you have time later this week to talk about the air modeling for the Solvay West Deptford facility? We now have all relevant data in hand, with the exception of the met data. We would like to

talk about the relevance and availability of the met data mentioned in the NJDEP air modeling guidance, and a review process for the model input files.

I am tied up until Wednesday of this week. Thursday and Friday are wide open between 9:30 am and 3:30 pm. Let me know if any of those times work for you.

Thanks

Jim

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 13 | Cell: 410.897.7006 | Fax: 410.573.9746

Exhibit F.1 – Items 5 and 6

From: John, Greg [mailto:Greg.John@dep.state.nj.us]
Sent: Tuesday, March 11, 2014 3:08 PM
To: Jim Lape <jlape@integral-corp.com>
Cc: Bergman, Erica <Erica.Bergman@dep.state.nj.us>; 'azzam.nidal@epa.gov' <azzam.nidal@epa.gov>; mitchell.gertz@solvay.com; Philip Goodrum <pgoodrum@integral-corp.com>; S. Xiah Kragie <xkragie@integral-corp.com>
Subject: RE: AERMOD Input Files for Solvay PFC Air Emission Modeling

Jim:

While I appreciate that each PFC source was modeled discretely to characterize the individual dispersion and deposition results for each, I would have liked to also see a modeling run with the cumulative impacts of all four PFC emission sources. Can you provide the BPIP files (i.e., .PIP, .SUM, .TAB, .SO) used to create the input files?

Greg John
Research Scientist
(609) 633-1106

From: Jim Lape [mailto:jlape@integral-corp.com]
Sent: Monday, March 10, 2014 12:26 PM
To: John, Greg
Cc: Bergman, Erica; 'azzam.nidal@epa.gov'; mitchell.gertz@solvay.com; Philip Goodrum; Jim Lape; S. Xiah Kragie
Subject: AERMOD Input Files for Solvay PFC Air Emission Modeling

Greg:

Attached are the input files for modeling air emissions of perfluoroalkyl compounds (PFCs) from the Solvay Specialty Polymers USA, LLC (Solvay) West Deptford, New Jersey, Plant (Site) located at 10 Leonard Lane in West Deptford Township, Gloucester County, New Jersey. The focus of the air modeling is certain PFCs used historically in manufacturing operations at the Site. The primary objective of the air modeling is to provide estimates of the spatial distribution of concentrations in air and particle deposition to surfaces in the areas surrounding the Site. The results will be used to refine the conceptual site model for PFC fate and transport, and to aid in decisions regarding future environmental sampling. The modeling will use estimated historic air emissions for the period from 1991 to 2010.

We are using the U.S. Environmental Protection Agency AERMOD (Vers. 13350) to conduct the air modeling for the four stacks of interest at the Site. The 2008 to 2012 meteorological dataset for Philadelphia International Airport provided by New Jersey Department of Environmental Protection (NJDEP) is being used for this evaluation. As discussed in the *Air Modeling Plan* submitted to NJDEP as Appendix C of the *Perfluorinated Compounds Work Plan* (November 15, 2013) the historic PFC air emission sources have been grouped as either primary or secondary stack sources. Two spray dryer stacks, PT3001 and PT3011, were identified as the primary PFC sources given they represent the most continuous source of PFC emission to the atmosphere. The secondary sources are stacks that vent tanks along the batch manufacturing process. Emissions from the secondary stacks, PT3002 and PT3004, are intermittent and are released at significantly lower flow rates than from the spray dryer vents.

Exhibit F.1 – Items 5 and 6

Each of the four stacks was modeled discretely in order to characterize the individual dispersion and deposition patterns. A unit emission rate was used to allow for scaling the model results with the facility-wide annual estimates of PFC air emissions. As noted in the *Air Modeling Plan*, each spray dryer vented one of two different PFC surfactants (i.e., Surflon or sodium perfluorooctanoate [NaPFO]), while the secondary stacks vented both, depending on the type of batch be processed at any given time. Sensitivity analyses will be conducted to address the contribution each stack could have made to the annual facility-wide PFC air emissions. A table providing the model input stack parameters and the nature of the source and historic emissions is also attached to this email.

Please let us know if you have any questions or comments regarding these files.

Thanks

Jim

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 13 | Cell: 410.897.7006 | Fax: 410.573.9746

Exhibit F.1 – Item 8

From: "Bergman, Erica" <Erica;Bergman@dep.state.nj.us>
Date: March 31, 2014 at 2:36:24 PM EDT
To: "Gertz, Mitchell (mitchell.gertz@solvay.com)" <mitchell.gertz@solvay.com>
Cc: "Park, Andy (Parl<.Andy@epa.gov)" <Park.Andy@epa.gov>
Subject: Solvay - EPA comments on air input parameters

Mitch,
EPA air program reviewed the air deposition input parameters and have the following comments:

- The AERMOD dispersion model was used in this case which is acceptable. NJDEP ran the AERMET preprocessor and provided the facility with the preprocessed meteorological data that is input to AERMOD. The meteorological data was measured at the National Weather Station in Philadelphia between 1990 to 1994 with concurrent upper air data from Atlantic City and Brookhaven. The time frame and location of the measurements are acceptable. However, it would be advisable to run the model and process the data using the most current version of AERMOD and AERMET. It is not clear which version was used in this case.

- The workplan notes that some of the meteorological parameters that are necessary for deposition modeling (such as precipitation and relative humidity) may be missing from the NJDEP data set. If so, the facility will obtain the additional data and include it in the final report. Again, this is acceptable but AERMET will need to be rerun using the full data set.

- The model plan assumes that all the terrain in the area is flat. If the terrain in the area of impact is below stack height then this may be a reasonable assumption. But if the terrain height exceeds the stack height then the AERMAP preprocessor should also be run using the actual terrain features. AERMOD would then need the actual base elevation of the emission points and of the anemometer. These must be inputted into the model (preferably in meters). Thereceptor grid would also need to reflect the actual ground elevation.

- There were separate input files for each emission point. It would be preferable to include all the emission points into a single input file so that the cumulative impacts may be better assessed.

Please let us know if you have any questions,

Erica Bergman
NJDEP - Bureau of Case Management
401 E. State Street - Mail Code 401-05
P.O. Box 420
Trenton, NJ 08625-0420
erica.bergman@dep.state.nj.us
609-292-7406

integral consulting inc.

Integral Consulting Inc.
200 Harry S. Truman Parkway
Suite 330
Annapolis, MD 21401

telephone: 410.573.1982
facsimile: 410.573.9746
www.integral-corp.com

MEMORANDUM

To:	Mitch Gertz, Solvay Specialty Polymers LLC
From:	Jim Lape, Integral Consulting Inc.
Date:	April 8, 2014
Subject:	Response to Comments from USEPA on Air Modeling Protocol for Airborne Perfluoroalkyl Emissions
Project No.:	C1165-0401

This memorandum provides responses to four comments from the NJDEP regarding the air modeling proposed for historic airborne emissions of perfluoroalkyl compounds from the Solvay Specialty Polymers USA, (Solvay) LLC facility in West Deptford, New Jersey. The comments were conveyed in an email from Erica Bergman of NJDEP to you on March 31, 2014. We have reproduced the comments below.

RESPONSE TO COMMENTS FROM USEPA

Comment #1 – *The AERMOD dispersion model was used in this case which is acceptable. NJDEP ran the AERMET preprocessor and provided the facility with the preprocessed meteorological data that is input to AERMOD. The meteorological data was measured at the National Weather Station in Philadelphia between 1990 to 1994 with concurrent upper air data from Atlantic City and Brookhaven. The time frame and location of the measurements are acceptable. However, it would be advisable to run the model and process the data using the most current version of AERMOD and AERMET. It is not clear which version was used in this case.*

Response #1 – The air modeling is being conducted using version 13350 of AERMOD, which is the most current version. We are using meteorological data provided by Greg John of NJDEP. The data were compiled for the period from 2008 to 2012 from surface observations at the National Weather Service (NWS) Station in Philadelphia, PA, and concurrent upper air data from the NWS Station in Sterling, VA. The data were processed using AERMET version 12345, which is compatible with AERMOD version 13350.

Comment #2 – *The workplan notes that some of the meteorological parameters that are necessary for deposition modeling (such as precipitation and relative humidity) may be missing from the NJDEP data set. If so, the facility will obtain the additional data and include it in the final report. Again, this is acceptable but AERMET will need to be rerun using the full data set.*

Response #2 – The meteorological data provided by NJDEP for this modeling effort contained all necessary parameters to allow for wet and dry particle deposition modeling; therefore, no additional data are required after all.

Comment #3 – *The model plan assumes that all the terrain in the area is flat. If the terrain in the area of impact is below stack height then this may be a reasonable assumption. But if the terrain height exceeds the stack height then the AERMAP preprocessor should also be run using the actual terrain features. AERMOD would then need the actual base elevation of the emission points and of the anemometer. These must be inputted into the model (preferably in meters). The receptor grid would also need to reflect the actual ground elevation.*

Response #3 – There are no locations within the model domain where the terrain elevations exceed the stack height for the primary stack sources. Additionally, the vast majority of the terrain within the model domain is below the shortest of the secondary stack sources. The terrain to the southeast of the air emission sources gently rises and reaches an elevation equal to or greater to the height of the secondary stack sources at a distance of 2 miles downstream. However, the maximum ground-level air concentrations in this direction for emissions from the secondary sources occur more than 1.5 miles upstream of this location.

In summary, the primary stack sources, which are the focus of this modeling exercise, are above the maximum terrain elevation throughout the model domain, and the effects of terrain on air concentrations for the secondary sources will be negligible in areas of elevated terrain. Accordingly, the model runs will reflect the assumption as specified in the Work Plan.

Comment #4 – *There were separate input files for each emission point. It would be preferable to include all the emission points into a single input file so that the cumulative impacts may be better assessed.*

Response #4 – Source-specific air emission data were not available for the site; therefore, each of the relevant stacks were modeled discreetly using a unit emission rate to provide an understanding of the relative dispersion and deposition characteristics for each source. In the absence of source-specific emissions data, these individual results, combined with an understanding of the nature of the processes leading to the airborne emissions, are fundamental to developing a reliable conceptualization of the spatial distribution of

airborne emissions. The final air modeling report will provide details on additional air modeling conducted as part of the sensitivity and uncertainty analysis performed for this project to evaluate the potential cumulative effect on the spatial distribution from multiple air emission sources operating simultaneously.

Exhibit F.1 – Item 9

From: Gertz, Mitchell [mailto:mitchell.gertz@solvay.com]
Sent: Wednesday, April 09, 2014 11:42 AM
To: Bergman, Erica <erica.bergman@dep.state.nj.us>
Subject: Response to comments on air dispersion model

Erica,

Attached is our consultant's (Integral) response to the comments on the air dispersion model.

Contact me if there are any questions.

--
Mitch Gertz
Solvay Specialty Polymers
HSE Compliance Manager
T: 856-251-6630 - M: 856-371-9318
10 Leonard Lane
West Deptford, NJ 08086
www.solvay.com

Exhibit F.1 – Item 10

From: Bergman, Erica <Erica.Bergman@dep.state.nj.us>
Date: Thu, Apr 10, 2014 at 10:37 AM
Subject: RE: Response to comments on air dispersion model
To: "Gertz, Mitchell" <mitchell.gertz@solvay.com>
Mitch,

Please see EPA's air modeling reviewer's comment below:

Response 1, 2 and 3 are adequate. However, Response 4 should still be addressed further. The modeling analysis will provide a better spatial distribution of the cumulative impacts if there is a model run with all the units emitting the same pollutant in a single run. This would show spatial distribution of the cumulative impacts rather than the individual units even if unit emissions are desired.

Please pass along to your air modelers for their consideration.

thanks, Erica

Erica Bergman

NJDEP - Bureau of Case Management
401 E. State Street - Mail Code 401-05
P.O. Box 420
Trenton, NJ 08625-0420
erica.bergman@dep.state.nj.us
609-292-7406

From: Gertz, Mitchell [mailto:mitchell.gertz@solvay.com]
Sent: Wednesday, April 09, 2014 11:42 AM
To: Bergman, Erica
Subject: Response to comments on air dispersion model

Erica,

Attached is our consultant's (Integral) response to the comments on the air dispersion model.

Contact me if there are any questions.

--
Mitch Gertz
Solvay Specialty Polymers
HSE Compliance Manager
T: 856-251-6630 - M: 856-371-9318
10 Leonard Lane
West Deptford, NJ 08086
www.solvay.com

Exhibit F.1 – Item 11

From: Jim Lape
Sent: Tuesday, May 06, 2014 6:21 PM
To: Greg.John@dep.state.nj.us
Cc: 'Erica.Bergman@dep.state.nj.us' <Erica.Bergman@dep.state.nj.us>; mitchell.gertz@solvay.com; Philip Goodrum <pgoodrum@integral-corp.com>
Subject: AERMOD Input Files for Solvay PFC Air Emission Modeling

Greg:

We are providing additional air modeling files related to our analysis of the historic PFC air emissions for the Solvay facility in West Deptford, NJ. The following bullets provide a description of the files and their respective names.

- BPIP input files for addressing building effects

A BPIP file is provided for each stack in the site air modeling.

o PT3001_UnitEmission_Method2,bpi = BPIP input file for stack PT3001

o PT3002_UnitEmission_Method2,bpi = BPIP input file for stack PT3002

o PT3004_UnitEmission_Method2,bpi = BPIP input file for stack PT3004

o PT3001_UnitEmission_Method2,bpi = BPIP input file for stack PT3011

- Combined source analysis for Surflon emissions

AERMOD input files for the range of scenarios used to evaluate combined Surflon emissions from all relevant air sources

o Surflon_661616_UnitEm = Assumes 66% of annual emissions from primary source (PT3001) and remaining 33% split equally between the secondary sources PT3002 and PT3004.

o Surflon_502525_UnitEm = Assumes 50% of annual emissions from primary source (PT3001) and remaining 50% split equally between the secondary sources PT3002 and PT3004.

o Surflon_333333_UnitEm = Assumes 33% of annual emissions from primary source (PT3001) and remaining 66% split equally between the secondary sources PT3002 and PT3004.

- Combined source analysis for NaPFO emissions

AERMOD input files for the range of scenarios used to evaluate combined NaPFO emissions from all relevant air sources

o NaPFO_661616_UnitEm = Assumes 66% of annual emissions from primary source (PT3001) and remaining 33% split equally between the secondary sources PT3002 and PT3004.

o NaPFO_502525_UnitEm = Assumes 50% of annual emissions from primary source (PT3001) and remaining 50% split equally between the secondary sources PT3002 and PT3004.

Exhibit F.1 – Item 11

o NaPFO_333333_UnitEm = Assumes 33% of annual emissions from primary source (PT3001) and remaining 66% split equally between the secondary sources PT3002 and PT3004.

Please let me know if you have any questions or comments.

Thanks

Jim

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 513 | Cell: 410.897.7006 | Fax: 410.573.9746

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: Jim Lape
Sent: Monday, March 10, 2014 12:26 PM
To: Greg.John@dep.state.nj.us
Cc: 'Erica.Bergman@dep.state.nj.us'; 'azzam.nidal@epa.gov'; mitchell.gertz@solvay.com; Philip Goodrum; Jim Lape; S. Xiah Kragie
Subject: AERMOD Input Files for Solvay PFC Air Emission Modeling

Greg:

Attached are the input files for modeling air emissions of perfluoroalkyl compounds (PFCs) from the Solvay Specialty Polymers USA, LLC (Solvay) West Deptford, New Jersey, Plant (Site) located at 10 Leonard Lane in West Deptford Township, Gloucester County, New Jersey. The focus of the air modeling is certain PFCs used historically in manufacturing operations at the Site. The primary objective of the air modeling is to provide estimates of the spatial distribution of concentrations in air and particle deposition to surfaces in the areas surrounding the Site. The results will be used to refine the conceptual site model for PFC fate and transport, and to aid in decisions regarding future environmental sampling. The modeling will use estimated historic air emissions for the period from 1991 to 2010.

We are using the U.S. Environmental Protection Agency AERMOD (Vers. 13350) to conduct the air modeling for the four stacks of interest at the Site. The 2008 to 2012 meteorological dataset for Philadelphia International Airport provided by New Jersey Department of Environmental Protection (NJDEP) is being used for this evaluation. As discussed in the Air Modeling Plan submitted to NJDEP as Appendix C of the Perfluorinated Compounds Work Plan (November 15, 2013) the historic PFC air emission sources have been grouped as either primary or secondary stack sources. Two spray dryer stacks, PT3001 and PT3011, were identified as the primary PFC sources given they represent the most continuous source of PFC emission to the atmosphere. The secondary sources are stacks that vent tanks along the batch manufacturing process. Emissions from the secondary stacks, PT3002 and PT3004, are intermittent and are released at significantly lower flow rates than from the spray dryer vents.

Exhibit F.1 – Item 11

Each of the four stacks was modeled discretely in order to characterize the individual dispersion and deposition patterns. A unit emission rate was used to allow for scaling the model results with the facility-wide annual estimates of PFC air emissions. As noted in the Air Modeling Plan, each spray dryer vented one of two different PFC surfactants (i.e., Surflon or sodium perfluorooctanoate [NaPFO]), while the secondary stacks vented both, depending on the type of batch be processed at any given time. Sensitivity analyses will be conducted to address the contribution each stack could have made to the annual facility-wide PFC air emissions. A table providing the model input stack parameters and the nature of the source and historic emissions is also attached to this email.

Please let us know if you have any questions or comments regarding these files.

Thanks

Jim
James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 13 | Cell: 410.897.7006 | Fax: 410.573.9746

Exhibit F.1 – Item 12

From: **Bergman, Erica** <Erica.Bergman@dep.nj.gov>
Date: Fri, Jun 13, 2014 at 3:26 PM
Subject: Solvay- Air modeling comments
To: "Gertz, Mitchell (mitchell.gertz@solvay.com)" <mitchell.gertz@solvay.com>
Cc: "Park, Andy (Park.Andy@epa.gov)" <Park.Andy@epa.gov>

Mitch,

Please see comments below from EPA and attached comments from DEP on the air modeling information submitted.

1) Model input files include runs with the combined emission units into one run as we previously requested. However, rather than using a unit emission rate of 1 gram/sec for each emission unit, the 1 gram/sec unit emissions were split across the number of units in that run. This would provide relative impacts but care would be needed when proportioning the impacts for future risk assessments. In other words, the impacts would only be a fraction of their actual emission emissions. Therefore, that fraction would need to be adjusted. Please explain how emissions would be adjusted in the case of future risk assessments.

2) A mean mass particle diameter of 0.68 is used in each model run. How was this value determined?

Let me know if you'd like to discuss these comments on Wednesday? I will try and send comments this afternoon or Monday regarding other (non-air) discussion items regarding the PFC workplan.

Erica

Erica Bergman

NJDEP - Bureau of Case Management

401 E. State Street - Mail Code 401-05

P.O. Box 420

Trenton, NJ 08625-0420

erica.bergman@dep.state.nj.us

609-292-7406

State of New Jersey

DEPARTMENT of ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

Division of Air Quality
Bureau of Technical Services
Air Quality Evaluation
401 E. State Street, P.O. Box 420
Trenton, NJ 08625-0027

June 10, 2014

TO : Erica Bergman, Bureau of Case Management

FROM: Greg John, Bureau of Technical Services

SUBJECT: Perfluorinated Compounds Work Plan, Solvay Specialty Polymers West Deptford Plant

The Bureau of Technical Services has reviewed the air dispersion modeling files provided on May 6, 2014. The information provided to date does not completely fulfill the Air Modeling Plan, dated November 15, 2013. The Air Modeling Plan's Presentation of Air Modeling Results section stated that,

> "The air modeling results will be conveyed to NJDEP in a report that provides text, tables, and figures to support critical review of the modeling approach and conclusions. Tables will be provided that summarize each of the AERMOD inputs and their source. The model-predicted concentrations and deposition will also be summarized in both tabular and graphical format. Graphical formats will include isopleths of concentrations and deposition flux shown on maps of the Site vicinity."

More specifically, the air dispersion modeling report should provide a description of the different modeling scenarios. For example, explain the use of unit emission rate percentages in different model runs (i.e., 33% from each source, 50-25-25% and 66-16-16% among the three sources). Explain the details of the Surflon model runs compared to the NaPFO model runs. Document/explain the use of mass mean particle diameter of 0.68 microns.

Furthermore, the air dispersion modeling submitted does not definitively demonstrate that air emissions can be excluded as a source of perfluorinated compounds in the water samples. A figure that shows the maximum water sample concentrations of perfluorinated compounds overlaid by the air modeling general impact isopleths would be helpful to this demonstration. Additionally, air dispersion modeling should be performed using averaging periods that are shorter than a year (e.g., monthly and 24-hour periods). If the locations of the predicted annual, monthly, and 24-hour air concentrations are not consistent with the locations of the maximum water sample concentrations, then the modeling will show that it is less likely that Solvay Facility air emissions are a source of the perfluorinated compounds in the water.

c: Annamaria Coulter, USEPA - Region 1

Andy Park, USEPA - Region 1

Exhibit F.1 – Item 13

From: Jim Lape
Sent: Thursday, July 03, 2014 2:09 PM
To: 'Greg John' <Greg.John@dep.nj.gov>
Subject: RE: Call to Discuss Solvay Air Modeling Comments

Excellent. I'll call you then. Hopefully Arthur will stay far enough off-shore to not mess with our holiday.

From: Greg John [mailto:Greg.John@dep.nj.gov]
Sent: Thursday, July 03, 2014 1:51 PM
To: Jim Lape
Subject: RE: Call to Discuss Solvay Air Modeling Comments

OK

From: Jim Lape [mailto:jlape@integral-corp.com]
Sent: Thursday, July 03, 2014 1:42 PM
To: Greg John
Subject: RE: Call to Discuss Solvay Air Modeling Comments

How about 11 am on Monday (7/8)?

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 513 | Cell: 410.897.7006 | Fax: 410.573.9746

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: Greg John [mailto:Greg.John@dep.nj.gov]
Sent: Thursday, July 03, 2014 1:09 PM
To: Jim Lape
Subject: RE: Call to Discuss Solvay Air Modeling Comments

I am free most of the week; I am NOT available between 10 AM and 12 PM on July 8, 10, & 11.

Enjoy the long weekend !

Greg

From: Jim Lape [mailto:jlape@integral-corp.com]
Sent: Thursday, July 03, 2014 12:43 PM

Exhibit F.1 – Item 13

To: Greg John
Subject: Call to Discuss Solvay Air Modeling Comments

Hi Greg:

Would you have any time early next week to talk about the comments regarding the air modeling for the Solvay facility in West Deptford? My time is pretty wide open between 9 am and 3 pm.

Have a great 4th.

Jim

James Lape | Senior Science Advisor
Integral Consulting Inc. | www.integral-corp.com
200 Harry S. Truman Parkway, Suite 330 | Annapolis, MD 21401
Tel: 410.573.1982, ext. 513 | Cell: 410.897.7006 | Fax: 410.573.9746

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

Exhibit F.1 – Item 16

From: Maybury, Steve <Steve.Maybury@dep.nj.gov>
Date: Fri, Jul 31, 2015 at 2:16 PM
Subject: comment letter
To: "Gertz, Mitchell" <mitchell.gertz@solvay.com>
Cc: "Bergman, Erica" <Erica.Bergman@dep.nj.gov>, "Migliarino, Maurice" <Maurice.Migliarino@dep.nj.gov>

Mitch,

Per our discussion today attached is our comment letter. After your technical teams review you have questions regarding air discharge/modeling let us know and we can set up a call/meeting.

Stephen E. Maybury
New Jersey Department of Environmental Protection
Chief, Bureau of Case Management
Mail Code 401-05F
PO Box 420
401 East State Street
Trenton, NJ 08625-0420

Phone# 609-633-1455

SOLVAY

September 22, 2015

Via Email and First Class Mail

Ms. Erica Bergman
Bureau of Case Management
New Jersey Department of Environmental Protection
Mail Code 401-05F
P.O. Box 420
Trenton, New Jersey 08625-0420

Subject: **Response to NJDEP Comments – July 31, 2015**
Solvay Specialty Polymers USA, LLC
SRP PI# 015010; Activity Reference Number: RPC 1200001

Dear Ms. Bergman:

On behalf of Solvay Specialty Polymers USA, LLC (Solvay), this letter provides responses to the New Jersey Department of Environmental Protection (NJDEP or Department) letter dated July 31, 2015. The Department's letter was prepared in response to the following three reports developed by Solvay and submitted to the Department on March 3, 2015 pursuant to a detailed work plan that was voluntarily developed by Solvay in consultation with the Department and the U.S. Environmental Protection Agency (EPA) and performed by Solvay as agreed upon with the agencies beforehand:

- *Summary Report of Findings of PFC Investigations;*
- *Delaware River Surface Water and Sediment Data Report; and*
- *Air Modeling Report for Perfluoroalkyl Compounds.*

The July 31 Department letter asserts that Solvay submitted the reports pursuant to the Site Remediation Reform Act (N.J.S.A. 58:10C-1 et seq.), the Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C), and the Technical Requirements for Site Remediation (N.J.A.C. 7:26E). This was never Solvay's agreement or intent, nor do we believe this assertion is legally supportable, as explained in response to NJDEP General Comments 4 and 5 below.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

For ease of reference the Department's comment appears in italics with the corresponding response below. Comments and the associated responses are presented in the order given by the July 31 letter.

TEMPORARY WELL POINT INVESTIGATION

Solvay conducted a groundwater investigation between the site and Woodbury Creek through the installation and sampling of groundwater and soils from five temporary well points (TWPs) at various depth intervals. This [element of Solvay's] investigation was not preapproved by the Department. Solvay concludes that there is no plausible ground water transport pathway that connects groundwater near the site with impacted groundwater (residential wells) near Woodbury Creek due to lower concentrations of PFNA and PFOA found in the TWPs compared to the impacted residential wells, the nearly 2 mile distance from the site to Woodbury Creek and since groundwater flows south-southeast and not toward Woodbury Creek. Solvay concludes that other sources must exist near Woodbury Creek to cause the PFNA detected in groundwater in that area.
NJDEP Comment 1. It is stated (Section 3.1) that 4,000-10,000 gallons of water were used at each TWP. In Section 3.3, it is stated each sample zone was purged for 1-2 hours to remove drilling fluids and water quality indicator parameters (WQIPs) were monitored until they stabilized; indicating the predominant presence of ground water.

Review of Appendix D (Groundwater Purge Logs) indicates that a total of roughly 345-585 gallons of water were reportedly purged from each TWP. Given that 4,000-10,000 gallons were added to each TWP, only about 3.5% to 14.6% of the drilling water was removed. Schilling and Hoyle (1996) note that drilling fluid must be recovered before sampling to ensure that samples represent ground water; not drilling fluid. When lost drilling fluid has not been adequately removed, dilution of contaminant concentrations in the aquifer may occur; sometimes extending a considerable distance. They noted that removal of water equivalent to that lost during drilling did not result in ground water samples consisting of 100% formation water. This is also noted by the USACE (1998), where it is stated that even removal of one or more volumes of water equal to that lost during drilling will not remove all of the lost fluid. Insufficient purging may result in under- prediction of chemical concentrations in ground water. In addition, WQIPs in most of the sample intervals had not stabilized. As such, it appears that the vast majority of water sampled was drilling water and not ground water; thereby potentially resulting in significant dilution of the ground water samples. Therefore, while the analytical results from the TWP sampling are not rejected, they must be qualified.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Response: Solvay disagrees with the Department's characterization that insufficient drilling fluid water was purged to adequately estimate the concentration in formation water. NJDEP's estimate of 3.5% to 14.6% is flawed. The purge volume for each sample interval was determined primarily based on changes in water quality parameters that indicated introduced water had been removed and formation water was being sampled (i.e., changes in temperature, oxidation-reduction potential, and dissolved oxygen). The screened interval at each sample location was no more than 5 ft and the temporary screen was set below the cased interval (at the bottom of the zone where water was introduced into the formation during drilling). Because of the horizontal anisotropy of coastal plain sediments, additional purging at the base of the cased hole would not be expected to remove 100% of the water introduced higher up in the formation, outside the cased interval.

Although this element of Solvay's work plan was not pre-approved, the Department has approved identical TWP development and sampling exercises in the West Deptford area relating to Solvay's ongoing investigation of volatile organic compounds (VOCs) under ISRA. In our ISRA VOC matter, the Department has accepted the identical TWP sampling approach as an effective sampling tool. More importantly, the validity of the TWP approach has been borne out by actual VOC data. Sampling conducted as part of the plant's VOC delineation program has shown that data initially collected from TWPs were subsequently verified and validated by follow up groundwater samples collected from properly constructed and developed monitoring wells. As the Department is aware, the VOC data from both the TWPs and the permanent wells are within the same order of magnitude for detected compounds.

Two of the TWP locations have been selected for installation of monitoring well pairs that will provide additional data on both PFC concentrations and water levels in this area.

NJDEP Comment 2. Ground water elevation (OWE) measurements from select TWP intervals were used (plus GWEs from MW34D, 35D & 36D) to construct the contour map provided as Figure 4-1. Southeasterly flow is depicted. DEP created a contour map using alternative GWEs (deep zone) provided on Table 3-3. This is provided on the last page and depicts curvature of the flow path more toward the east. It is acknowledged that this representation may simply be constrained by the number and location of monitoring points (i.e., no points south of the TWPs that may have even lower GWEs).

It is stated (Section 3.4) that water levels were not used from intervals where significant water was introduced during drilling. While noted, there is no indication as to the exact amount of water introduced at a particular location or interval. In addition, as noted in Comment # 1, it appears that

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

a significant amount of drilling water remained at each TWP location/interval. As such, this introduces uncertainty regarding natural water levels in the various intervals and the exact direction of ground water flow in this area.

Response: It was unclear from the single map provided by NJDEP how the water level data were selected to generate the contour intervals. Solvay was able to match the labels on the map to specific data points submitted, but again the criteria for data selection for the final map (i.e., both the time periods and depth intervals) are not presented.

The contour map presented by Solvay was developed using water level data collected in the morning after the TWP had been allowed to equilibrate overnight, which provides a more accurate representation of water depth than water level data collected immediately after drilling ceased, which is what NJDEP appears to have used. These elevations are inappropriate for contouring given the large degree of variability observed related to the introduction and removal of water during drilling activities. As a result, the Department's contour map does not reflect equilibrated (i.e., actual) groundwater conditions and, therefore, should not be relied upon for this purpose since it is misleading.

Future groundwater contour maps prepared as part of the investigation will be based on permanent well data only. Solvay respectfully requests that the Department reissue its contour map to reflect equilibrated water level measurements so that the written record in this matter remains clear.

NJDEP Comment 3. Upon receiving the samples at the laboratory, the cooler's temperature was above the QC criterion. Therefore, the results of samples FB0002, FB0003, TB0100, GW1001, GW1002, GW1003, TB0102, EQ0004, FB0007, GW1023 and GW1006 are quantitatively qualified. Although the elevated cooler temperatures are noted in Section 1 in the LDC data validation report, no action is noted as having been taken for this QC deficiency. Therefore, the LDC data validation and the PFC Summary report must be revised to report the effected sample data with the "J" qualifier.

Comments on the TestAmerica and AXYS laboratory data and Integral Consulting data validations/usability reviews will be provided under separate cover.

Response: A revision to the data qualifiers, which were independently validated, is not warranted because the temperature met the method requirement as described below. The samples in question were received by AXYS at 9.1 °C and 7.1 °C and analyzed for perfluoroalkyl compounds (PFCs) using AXYS' proprietary method, approved by the

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Department. The AXYS method does not specify criteria for sample temperature upon receipt.

Furthermore, the sample temperatures complied with specifications given by Section 8.4 of the EPA Method 537, which states:

> *SAMPLE SHIPMENT AND STORAGE – Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.*

The samples in question satisfied the 10 °C threshold given by EPA Method 537.

And as a practical matter, the target PFC compounds are not volatile and do not degrade. The temperature requirements in sample handling procedures are safeguards for sample representativeness for less stable compounds. For these reasons the data were not qualified.

In addition, all samples were reviewed by an independent data validator to assess the usability of the data. The independent data validator did not qualify the data with a "J" or other notation as it was determined that the temperature of the temperature blank in the cooler for the samples at issue did not have an adverse effect on the results and no further qualification was required. As such, based on the approved AXYS method, the temperature requirements of EPA Method 537 and no additional qualification as a result of the temperature by LDC, resubmission of the PFC summary report is not warranted.

No additional Department comments regarding data validation/usability for TestAmerica and AXYS Laboratory have been provided to Solvay concurrent with or subsequent to NJDEP's July 31 letter.

NJDEP Comment. The Summary Report states that additional groundwater sampling downgradient from the Plant is anticipated and that no expansion of the TWP investigation near Woodbury Creek is planned. However, during the meeting held on June 10, 2015 between DEP/EPA and Solvay, Solvay committed to conducting delineation of groundwater extending radially, in all directions from the Plant. To address the uncertainties noted in Comments # 1 and #2 above, Solvay should obtain ground water quality and flow data from permanent wells, including in the direction of Woodbury Creek in accordance with N.J.A .C. 7:26E-4.3(a) 4. While the installation of new wells at the appropriate locations and intervals is preferred, existing wells (if available) may be used.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Response: As explained above, and in response to NJDEP General Comments 4 and 5 below, N.J.A .C. 7:26E-4.3(a) 4 is not applicable to the off-site investigation here. Further, there is no specific groundwater standard under the Tech Regs to use in delineation. Despite this, and in keeping with Solvay's commitment and intent to continue to gather actual data so that the science can continue to be followed for a comprehensive understanding of area groundwater, installation of permanent monitoring wells and the collection of samples to characterize groundwater quality and flow direction are included in the PFC investigation work plan, submitted to the Department under separate cover.

DELAWARE RIVER SURFACE WATER AND SEDIMENT INVESTIGATION

Solvay collected surface water, sediment, and pore water from 27 stations in the Delaware River; some samples were collected at the same locations as the DRBC sampling conducted in 2007 - 2009. PFNA was not detected in surface water samples, but was detected in some sediment and pore water samples. Solvay does not propose additional sampling.

NJDEP Comment 1. Solvay does not include an evaluation of the surface water to ground water pathway. The physical connection between the Potomac-Raritan-Magothy aquifer (PRM) and surface water (i.e., Delaware River & its tributaries) has been well documented in the literature; most notably, by Navoy and Carleton (1995). Surface water of degraded quality can affect the ground water system as a result of: (1) induced recharge from the Delaware River and its tributaries to the PRM; (2) the physical connection between the Delaware River (and tributaries) and the PRM; and (3) tidal effects.

A plausible transport mechanism therefore exists for the effects of a surface water discharge from the site to be detected in ground water (including wells not solely along a downgradient flow path from the site). This was acknowledged by Solvay on page 6 of the 7 May 2014 Status Update, PFNA Investigation where it is stated "Wells with elevated PFCs are completed in aquifer units that recharge from the Delaware River." It should be noted that following the June 10, 2015 meeting, Solvay did commit to include an evaluation of the surface water to groundwater pathway in their pending PFC investigation workplan.

Response: Solvay proposed and the Department approved Solvay's work plan for the collection of sediment and surface water samples from the Delaware River. As the Department may recall, the initial basis for Solvay's Delaware River surface water sampling was for Solvay to replicate, in substantial respects, prior work conducted by and published by the Delaware River Basin Commission (DRBC) in assessing the presence or absence of perfluorononanoic acid (PFNA) in Delaware River. Solvay's express intent with this work

element, as approved by the Department, included no evaluation of potential surface water to groundwater pathways. However, as subsequently discussed with the Department, as additional data are collected, a conceptual site model will be developed and modified, as needed to assess potential migration pathways of PFCs proximate to the Site.

Also, the Department misinterprets Solvay's quoted statement extracted from Solvay's May 7, 2014 Status Update. While PFCs have been detected in monitoring wells screened in aquifer units that present beneath the Delaware River, Solvay's acknowledgement of this fact in no way identifies the source(s) of these PFCs in groundwater. A definitive migration pathway (e.g., surface water to groundwater) for any particular well has not been determined.

The PFC investigation work plan submitted to the Department proposes tasks to evaluate a surface water to groundwater pathway proximate to the plant. It should be noted that PFNA was not detected in surface water of the Delaware River from samples collected in 2014; therefore, any further or definitive characterization of a potential surface water discharge-to-groundwater pathway based on actual data is likely not possible.

2. *The conclusion (p. 4-3) that no further surface water or sediment sampling is planned seems premature, especially in light of Solvay's commitment to evaluate the surface water to groundwater pathway and will aid in the development of a conceptual site model. Additional surface water and sediment sampling should be targeted to the Solvay surface water discharge (the outfall, inside the mixing zone, and outside the mixing zone) and those tributaries to the Delaware River that may be a migration pathway or source to the ground water aquifer pumped by local private wells and the public water supply wells, along with some locations in the Delaware River to monitor and confirm the recent results and for use in the evaluation of the results from the recommended additional investigations.*

Response: The PFC investigation work plan submitted to the Department proposes tasks to further characterize surface water and sediment in tributaries near the outfall – specifically from multiple locations in the Main Ditch and Little Mantua Creek.

NJDEP Comment 3. The report does not discuss or evaluate Solvay's historic and current PFCs discharges to the Delaware River and does not discuss PFC concentrations in the river prior to Solvay's installation of carbon treatment for PFCs versus post-treatment. DEP questions whether PFCs are largely not detectable in the surface water samples from the Delaware River (particularly in Reach D around the Solvay Facility), compared to historical surface water PFC data because of the recent treatment of the Solvay surface water discharge to remove PFCs. The carbon treatment may

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

have a greater effect on the spatial distribution of PFCs in 2014 than tidal dynamics and the presence of other sources as discussed further below.

Response: None of the suggested work described in this comment was included in the Department approved work plan. However, the Department's underlying assumed facts are not correct.

Solvay's carbon treatment system was offline between July and September 2014, which included the entire sampling period.

Moreover, all samples were collected during a low flow period when less dilution would have occurred. Specifically, samples were collected during the summer, which is the period of low flow conditions for the Delaware River system. Flow records maintained by the U.S. Geologic Survey at the Delaware River gauge station at Trenton include the mean of daily mean values for each day for more than 100 years, between October 1912 and September 2014. During this particular sampling event in August 2014, flows in the Delaware River were among the lowest for the year.

Therefore, if anything, actual circumstances and facts would suggest that PFNA levels measured in 2014 would be biased on the high side. Despite this, there were no detections of PFNA in any of the surface water samples collected from the Delaware River.

NJDEP Comment 4. The evaluation of the surface water data does not include any assessment of tidal stage at the time of sampling and how this may have affected the sample results. The tidal stage at the time each sample was collected is not noted or identified anywhere in the report or report appendices, but it should be possible to estimate this from other sources. There are two questions that the tidal stage may help answer. One, at certain tidal stages sample results could be diluted indicating a potential net negative bias to the sample results? Two, does the tidal stage help explain why some PFCs are found in the surface water samples collected from the river reaches farther downstream from the Solvay facility (Reaches A to C), but not in the Reach D samples closer to the Solvay facility? This may be a more likely explanation, rather than the other sources explanation as stated on pages viii and 3-2 for PFNA, although there are no data or analysis presented to support this statement concerning other sources discharging to the river. The similar data distribution for PFOA and PFOS is used to indicate source discharges downriver from Solvay with the implication that Solvay is not responsible for the PFCs in the Delaware River. This seems to be an over interpretation of the data without actual data on tidal stage at the time of sample collection and hydrographic assessment of flow dynamics in the river for the 2007-2009 and 2014 sampling events.

Response: The lowest flows in the Delaware River and its tributaries are observed from August to October and when sampling occurs at low flow periods there is limited interference from dilution associated with higher discharges more commonly observed in the spring. As stated in the response to Comment #3, during this particular sampling event in August 2014, flows in the Delaware River were among the lowest for the year. Tidal mixing during the sampling period will be considered in evaluations of mixing volumes as part of the work plan submitted concurrently with this letter.

This comment appears to simply ignore the possibility of other sources of PFNA in the environment, in this case along a significant stretch of the Delaware River. The Department's position is not supported by the scientific literature, which clearly identifies multiple potential source contributions in urban watersheds like the Delaware River watershed. These include PFC precursors and residual PFNA in aqueous film forming foam (AFFF) used and stored for fire prevention and training at airports, ports, and oil and gas refineries (see for example, Backe et al. 2013; Harding-Marjanovic et al. 2015; Houtz and Sedlak 2012; Place and Field 2012; Prevedouros et al. 2006; and Weiner et al. 2013); landfill leachate (Allred et al. 2014; Benskin et al. 2012; Busch et al. 2010; Eggen et al. 2010; Huset et al. 2011; Li et al. 2012); waste water treatment plant effluent (Schultz et al., 2006; Sinclair and Kannan, 2006) and land application runoff (Konwick et al. 2008); and industrial processes involving products that may include PFNA and other PFCs (Bossi et al. 2007; Clara et al. 2008; Konwick et al. 2008). Solvay will provide additional information regarding the evidence for multiple sources of PFNA in the environment based on these citations under separate cover.

Solvay also notes that the Department submitted comments to the Agency for Toxic Substances and Disease Registry (ATSDR) during the public comment period for ATSDR's 2009 *Draft Toxicological Profile for Perfluoroalkyls*. In its comment letter dated October 30, 2009 (corrected November 2, 2009), the Department states:

An important source of perfluoroalkyls in surface water and drinking water is discharge from wastewater treatment plants.

Citations:

Allred, B.M. Lang, J.R., Barlaz, M.A., Field, J.A. 2014. Orthogonal zirconium diol/C18 liquid chromatography-tandem mass spectrometry analysis of poly and perfluoroalkyl substances in landfill leachate. J. Chromatogr. Accepted (in press) and available online July 2014. http://dx.doi.org/10.1016/j.chroma.2014.07.056

Backe, W.J., T.C. Day, and J.A. Field. 2013. Zwitterionic, cationic, and anionic fluorinated chemicals in aqueous film forming foam formulations and groundwater from U.S. Military bases by nonaqueous large-volume injection HPLC-MS/MS. *Environ. Sci. Technol.* 47(10):5226–5234.

Benskin, J.P., B. Li, M.G. Ikonomou, J.R. Grace, and L.Y. Li. 2012. Per- and polyfluoroalkyl substances in landfill leachate: Patterns, time trends, and sources. *Environ Sci. Technol.* 46(21):11532-11540.

Bossi, R., J. Strand, O. Sortkjaer, and M.M. Larson. 2008. Perfluorinated compounds in Danish wastewater treatment plants and aquatic environments. *Environ. Int.* 34(4):443–450.

Busch, J., L. Ahrens, R. Sturm, and R. Ebinghaus. 2010. Polyfluoroalkyl compounds in landfill leachates. *Environ. Pollut.* 158:1467–1471.

Clara, M., Scharf, S., Weiss, S., Gans, O., & Scheffknecht, C. 2008. Emissions of perfluorinated alkylated substances (PFAS) from point sources-identification of relevant branches. Water Science and Technology Vol 58 No 1 pp 59–66.

Eggen, T., M. Moeder, and A. Arukwe. 2010. Municipal landfill leachates: A significant source for new and emerging pollutants. *Sci. Tot. Environ.* 408(21):5147-57.

Harding-Marjanovic, K.C., E.F. Houtz, S. Yi, J.A. Field, D.L. Sedlak, and L. Alvarez-Cohen. 2015. Aerobic biotransformation of fluorotelomer thioether amido sulfonate (Lodyne) in AFFF-amended microcosms. *Environ. Sci. Technol.* 47(15):8187-8195.

Houtz, E.F., and D.L. Sedlak. 2012. Oxidative conversion as a means of detecting precursors to perfluoroalkyl acids in urban runoff. *Environ. Sci. Technol.* 46:9342–9349.

Huset, C.A., M.A. Barlaz, D.F. Barofsky, and J.A. Field. 2011. Quantitative determination of fluorochemicals in municipal landfill leachates. *Chemosphere.* 82(10):1380-1386.

Konwick, B. J., Tomy, G. T., Ismail, N., Peterson, J. T., Fauver, R. J., Higginbotham, D. and Fisk, A. T. (2008), Concentrations and patterns of perfluoroalkyl acids in Georgia, USA surface waters near and distant to a major use source. Environmental Toxicology and Chemistry, 27: 2011–2018.

Li, B., M.N. Dannon-Schaffer, L.Y. Li, M.G. Ikonomou, and J.R. Grace. 2012. Occurrence of PFCs and PBDEs in landfill leachates from across Canada. *Water Air Soil Pollut.* 223:3365–3372.

Place, B.J., and J.A. Field. 2012. Identification of novel fluorochemicals in aqueous film-forming foams (AFFF) used by the US Military. *Environ. Sci. Technol.* 46(13):7120-7127.

Prevedourous, K., I.T. Cousins, R.C. Buck, and S.H. Korzeniowske. 2006. Sources, fate, and transport of perfluorocarboxylates. *Environ. Sci. Technol.* 40(1):32-44.

Schultz, M. M., Higgins, C. P., Huset, C. A., Luthy, R.G., Barofsky, D. F., and Field, J. A. 2006a. Fluorochemical mass flows in a municipal wastewater treatment facility. *Environ. Sci. Technol.* 40(23):7350–7357.

Sinclair, E. & Kannan, K. 2006 Mass loading and fate of perfluoroalkyl surfactants in wastewater treatment plants. *Environ. Sci. Technol.* 40(5), 1408–1414.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Weiner, B., L.W.Y. Yeung, E.B. Marchington, L.A.D. D'Agostino, and S.A. Mabury. 2013. Organic fluorine content in aqueous film forming foams (AFFF) and biodegradation of the foam component 6:2 fluorotelomermercaptoalkylamido sulfonate (6:2 FTSAS). *Environ. Chem.* 10:486-493.

NJDEP Comment 5. The conclusion that other sources contributed or continue to contribute PFCs (particularly for PFNA, PFOA, and PFOS) to the river system is based mainly on the locations of the samples and changes in concentrations over time, however no information is provided to substantiate this conclusion that "may have an association with PFCs"(pp. 1-2 and 4-1, and Figures A-1 and A-2). While the DuPont facility downstream from Solvay may be an obvious potential contributor of PFCs to the river system, data are not presented to indicate this possibility or for any other potential sources. Analysis of the data acquired to date indicates that Solvay has been the major contributor of PFCs, particularly PFNA, to this area of the Delaware River given previous and current river data and taking into consideration Solvay's 2010 elimination of Surflon use and the timing of treatment on the Solvay surface-water discharge to remove PFCs.

Response: See the response to Comment #4 above regarding multiple potential source contributions of perfluoroalkyls to surface water and groundwater as presented in the scientific literature and noted by the Department itself as early as 2009. Solvay will provide additional information and citations under separate cover.

NJDEP Comment 6. The statement on page six that the distribution of PFC concentrations is comparable to other urban systems is not otherwise discussed or evaluated elsewhere in the report. The relevance of the other urban river systems to the Delaware River system is not clear and the references cited are not provided for review. The Department is not aware of conclusive determinations of "urban background" in the literature. The implication that all PFCs measured in 2014 can be attributed to some sort of urban background is not acceptable, since there has been a confirmed and continuing discharge of PFCs from the Solvay facility to the Delaware River.

Response: Please see the response to Comment #5.

NJDEP Comment 7. Vertically integrated water column samples were collected (p. 2-3), but there is no SOP in the November 2013 Field Sampling Plan (FSP) for the collection of this type of sample, because this type of sample collection was not originally included in the FSP. Either an SOP should be provided or a detailed description of this sampling procedure should be submitted for review. It is assumed that these samples were collected acceptably.

Response: The standard operating procedure (SOP) for vertically integrated water column samples is included as an attachment to the work plan submitted concurrently with this letter.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

NJDEP Comment 8. Sediment pore water samples were collected at the laboratory by decanting and centrifuging the samples (p. 2-5). Because pore water samples were collected in response to a Department comments, there is no SOP in the November 2013 FSP for the collection of this type of sample. Either an SOP should be provided or a detailed description of this sampling procedure should be submitted for review. It is assumed that these samples were collected acceptably. While this is an acceptable method, it does not provide results as representative as in-situ samplers would have provided. This uncertainty is not discussed in the report (see http://www.itrcweb.org/contseds-bioavailability/consed_4.htm). The sediment results and particularly the pore water results are consistent with the presumed pathway by which PFCs enter the ground water aquifer pumped by the private wells and public water supply systems in this area. PFNA was consistently detected and at the highest concentrations in Reach D consistent with Solvay as the main source of PFNA to the Delaware River in the study area.

Response: The SOP for sediment pore water sampling analysis is included as an attachment to the work plan submitted concurrently with this letter.

NJDEP Comment 9. It is not clear why figures are not included presenting the PFC analytical data. As there are detailed discussions of the spatial distribution and patterns of PFCs in surface water, sediment, and sediment pore water, this information should have been shown on figures.

Response: Figures showing PFC analytical data will be considered in future submittals where appropriate.

NJDEP Comment 10. It is not clear why the non PFC analytical results are presented on the figures as ratios of the measured concentration to the NJ DEP ecological screening criteria (2009).

Response: This presentation format facilitates identification of samples and locations where concentrations approach or exceed existing water quality standards. The Delaware River system is complex with many sources for the many constituents detected there.

NJDEP comment 11. The Eurofins Eaton laboratory was not used for the PFC analyses so the method detection and reporting limits are higher. Therefore, PFCs that may have been present based on Eurofins analyses are nondetectable for this study, which may give the false impression that PFCs are not present or less ubiquitous when they actually are present in the various sample types collected.

Response: We find this comment perplexing. The Department has not certified Eurofins Eaton for analysis of surface water and sediment. The cited lab is only certified by the Department for the analysis of drinking water samples by EPA Method 537. A different

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

method is required for analysis of surface water and sediment, and Eurofins is not certified by the Department for those methods. Therefore, surface water and sediment samples were analyzed by AXYS Analytical Services, Ltd. which is certified by the Department (NJDEP Certification #CANA005).

AIR MODELING REPORT FOR PERFLUOROALKYL COMPOUNDS

Air dispersion modeling conducted by Solvay shows that a majority of the impact concentrations and deposition from historic perfluoroalkyl compound (PFC) emissions at Solvay Specialty Polymers occurred within the facility boundary and decreased significantly a few hundred meters off-site. Although the results of the model that was run were appropriately characterized in this report, further evaluation of the model indicates that the inputs to the model considered narrow scenarios and assumptions made were not clearly stated and were not properly supported by peer reviewed literature or other valid scientific reports. For example, the averages of multiple input parameters were used, and therefore peak values (e.g. wind speeds, particle size distribution, emission concentrations, stack velocities) were not considered. These peak values may have resulted in a higher magnitude of contamination and dispersion to more distant locations than have been concluded in this report. In addition, consideration of only the particulate form, but not the vapor form, of the contaminant may underrepresent the transport capacity that this compound possesses as part of secondary particulate formation.

Response: Frankly, and as a general matter, we are significantly concerned by the nature and extent of the Department's air modeling comments at this time. Overall, these comments are not consistent with the frequent, extensive, iterative, and collaborative technical interactions among Solvay, the Department, and EPA throughout the air modeling process. This collaborative effort began as far back as November 2013 with the submission of the air modeling plan, which provided details and justification on the air model to be used, the sources to be evaluated, and the particle size distribution (PSD). Many discussions and exchanges took place in the interim, including submission of the air model input and output files for the baseline and combined source analysis for agency review in March and May of 2014, respectively, and follow-up activities were conducted to ensure that all comments from the Department and EPA review were addressed. As recently as our June 10, 2015 meeting, the Department and EPA agreed with Solvay's overall air modeling methodology and conclusions, and indicated that only minor comments were forthcoming at a later date.

Despite our concerns, responses to each specific point are provided below.

NJDEP Comment 1. Model Assumptions

- Particles

a. Particle size distribution is an important, sensitive parameter in air dispersion modeling. In this case, particle size distribution was not determined from stack emission tests at the facility. Instead, the particle distribution used was taken from "a comparable manufacturing process using a similar long carbon-chain PFC fluorosurfactant, perfluorooctanoic acid (PFOA) (Table 4 of report, attributed to Paustenbach et al., (2007)). It is unclear how this distribution was provided as an input to the model, but a median value of 0.68 μm was stated as an assumption (Section 3.3 of report). This assumption would not provide adequate results, given that 53.8% mass fraction (Shinn, 2011) were less than 0.2 μm in diameter. The smaller particles would most certainly travel longer distances.

1a. Response: The AERMOD model input for the PSD was the mass mean particle diameter and not a median value. Details of the calculation for the value of 0.68 micron were provided in Table 4 of the air modeling report which shows the values were calculated as mass weighted-average using the mass fraction as a function of mean particle size for both of the distributions used in the analysis. The AERMOD model input of 0.68 micron was the average of the mass-weighted particle diameter calculated for the two distributions. Both of the PSDs shown in Table 4 were identified and proposed for use in the air modeling plan submitted in November of 2013, which the Department approved.

b. Integral Consulting states that, "based on the nature of PFCs and the manufacturing process used at the Plant, the emissions from the stacks would have been primarily, if not exclusively, in a particle form." Although this may be true, this conclusion is not supported with stack tests from the facility. Although many PFCs have a low vapor pressure and may partition to the particulate phase in environmental conditions, PFCs can also be found in the aerosol and vapor forms (McMurdo, 2008). These forms of PFCs, which have been found to substantially contribute to long range transport (Armitage, 2009), should be considered in this evaluation (or at a minimum, in the sensitivity analysis).

1b. Response: The historical polyvinylidene fluoride (PVDF) fluoropolymer process at the Site used the salt form of the surfactant, which has been shown in the literature to possess a vapor pressure that is 1,000 times lower than the value for the corresponding acid. Thus, the Site PFC emissions would have been in particulate form given that the virtually non-volatile salt was the emitted species. This assumption for PFC emissions from a fluoropolymer manufacturing plant is supported by the work summarized in Davis et al. (2007 [*Chemosphere* 67:2011-2019]). This review of emissions around DuPont's Parkersburg

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

plant used particulate emissions to model air dispersion of APFO/PFOA, supported by actual measurements of particulates vs. vapor phase emissions. This particulate assumption was also used in the more recently published work by Shin et al. (2011 [*Environ. Sci. Technol.* 45:1435-1442]). Furthermore, the Armitage (2009) study cited in the comment was a mass balance analysis that attempted to correlate various environmental measurements with modeled emissions on a global basis. The authors conclude that the hypothesis that atmospheric degradation of fluorotelomer alcohols is the dominant source of long range transport for long carbon-chain PFCs (not direct emissions during manufacturing), is consistent with monitoring data for C10 through C13.

c. *The "Estimated Historical Plant-Averaged Emission Rate" of 0.0531 g/s used in the model is an average of emissions over a twenty year period and does not represent the maximum potential emissions that would lead to deposition. Relying on this value will provide a view of reduced impacts. In 1997, this value would be 0.0772. Note that this is still an average and would not include peak emissions or surges for unknown reasons. The maximum annual average emissions rate should be included in the model, run together with peak wind speeds.*

1c. Response: We disagree. Use of a 5-year meteorological dataset is consistent with regulatory guidance, past Department practice, and is based on studies to identify the period of record needed to ensure worst-case meteorological conditions were adequately represented in the model results. Accordingly, the worst-case meteorological conditions would have been included in the model-predicted deposition results. The air modeling was conducted to simulate the potential loading to the environment over the entire period when PFC emissions occurred. Simulating just the maximum emission would be of limited utility as the results would represent a narrow range over the period of deposition. The model predicted total deposition was based on hourly estimates at each receptor location, using a 5-year record of hourly meteorological observations, which were then summed to determine the total for a year. As an aside, this is the same modeling construct adopted by the Department in evaluating the PFC emissions from the Chambers Works facility.

- *Sensitivity Analysis*

The sensitivity analysis portion of any modeling effort should include scenarios using the extreme boundaries of input parameters (highest wind speeds, highest concentrations, smallest particle distributions) to detect potential impacts of worst case scenarios. This sensitivity analysis was inadequate to evaluate the full range of potential outcomes.

Response: Solvay believes the sensitivity analysis was adequate to evaluate the full range of potential outcomes because it evaluated the changes in model predictions related to the

PSD input and building downwash computation, which were identified as the most significant sources of uncertainty in the model results. The uncertainty in model predictions related to the contribution of individual sources to site-wide emissions was evaluated in the combined source analysis by evaluating a range of plausible, likely scenarios.

The typical goal of a sensitivity analysis is to provide insights into the level of confidence in the model results based on the uncertainty in key inputs and computations rather than to bias all inputs to produce worst-case conditions that may not be representative of the real-world (USEPA. 2001. Risk assessment guidance for superfund: Volume III – Part A, Process for conducting probabilistic risk assessment. EPA 540-R-02-002. OSWER 9285.7-45).

A. *Particle Size Distribution: The sensitivity analysis to evaluate the effect of particle size distribution only increased the size of the particle. This would have the sole effect of having the particle drop out closer to the source. Another scenario to determine the sensitivity of the particle size distribution on the output of the model would be to use a distribution that also includes smaller particles.*

A. Response: The suggested modeling scenario is technically unjustified for the current evaluation. The PSD modeled in this evaluation was primarily sub-micron particles, as noted in comment 1.a above. Modeling a PSD even more skewed to sub-micron particles was considered unnecessary as such particles begin to behave much like a gas. As discussed in the Report, the gas-phase concentration modeling conducted for the evaluation indicated that maximum concentrations occurred within the plant boundaries and decreased with distance from the Site, which was consistent with the particle deposition modeling. Therefore, the modeling was considered sufficient to determine that results and conclusions would not change with the use of a smaller PSD.

B. *The modeling report should include a discussion on dry deposition vs. wet deposition concentrations (how were these included and discuss results).*

B. Response: The air modeling was conducted using both wet and dry deposition considerations and expressed as total deposition. The goal of the modeling was to provide an indication of the spatial characteristics of potential deposition loading to the environment from air emissions of PFCs. It is not clear how examination of wet versus dry deposition aids in that process, nor is it clear how the requested discussion is part of a sensitivity analysis.

C. Building downwash: In reporting the results of this model run, it is stated that, "influence considering building downwash was highly localized, showing a maximum within plant boundaries for the majority of locations outside the Plant boundary the effect was negligible, with most locations yielding a ratio of approximately 1." These results should be questioned based on the first principles of physics, and detailed input parameters and results should be included.

C. Response: It is not clear what "first principles of physics" NJDEP is referring to that are alleged to be inconsistent with the results. Empirical studies have confirmed that building downwash effects are most significant in the wake cavity produced by structures (see EPA's AERMOD reference documents. The building cavity is a highly localized phenomenon that extends downwind from the relevant structure. Once outside of the building wake regions the plume dispersion is consistent with what occurs to non-downwashed plumes. The AERMOD input and output files for the building downwash analysis were provided as part of the air modeling report.

NJDEP Comment 2. Model Output

a. Aermod is a steady-state model. The modeling analysis should have been significantly more robust in order to eliminate air as a pathway for loading to the environment. The air modeling report should have gone further to include a discussion on limitations and uncertainties of the model. The proposed revision to the Guideline on Air Quality Models (Appendix W to 40 CFR Part 51) issued July 14, 2015 states:

> *"Gaussian plume models use a "steady-state" approximation, which assumes that over the model time step, the emissions, meteorology and other model inputs, are constant throughout the model domain, resulting in a resolved plume with emissions distributed throughout the plume according to a Gaussian distribution. This formulation allows Gaussian models to estimate near-field impacts of a limited number of sources at a relatively high resolution. However, this formulation allows for only relatively inert pollutants, with very limited considerations of transformation and removal (e.g., deposition), and further limits the domain for which the model may be used. Thus, Gaussian models may not be appropriate if model inputs are changing sharply over the model time step or within the desired model domain or if more advanced considerations of chemistry are need. "*

2a. Response: AERMOD was the Department-approved model for this modeling exercise. The comment notes several conditions that would make using AERMOD inappropriate; however, none of those conditions are relevant to this modeling exercise.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

b. The air modeling report did not include maps showing the air concentration isopleths that correspond to the deposition modeling with estimated historical PFC emission rates. Please submit all scenario results maps to include both deposition (g/m2) and air concentration (µg/m3). (Figures 10, 11 and 12 do not have corresponding concentration isopleths).

2b. Response: The goal of the modeling was to simulate potential deposition loading to the environment over the period of emissions. The modeling approach was constructed to provide insights on the dispersion characteristics associated with emissions from each of the modeled sources individually and then simulate a range of combined source contributions. The model predicted air concentration and deposition results were presented for each individual air emission source, along with isopleths of concentration and deposition. The air model predicted maximum concentration and deposition for each source occurred within the site fence line with decreasing values with distance from the source, as is clear from the associated figures. The spatial similarities in the concentration and deposition isopleths with respect to direction show the same transport potential in response to the regional wind patterns. The same consistency in the spatial distribution of model predicted air concentrations and particle deposition occurred for the combined source analysis, as stated in the report. Thus Figures 10 through 15, which provide isopleths for the combined source analysis, provided more detailed insights into the particle deposition results, consistent with the goal of the air modeling.

c. The air modeling report should include an analysis of mass balance for PFNA (annual and over entire time of emissions) and determine load (under multiple scenarios) to all areas. This is a way to check if all sources of PFNA at the facility were accounted for in all of the modeling pathways (i.e., air, surface water, and groundwater intrusion). During research of previous DEP air permits, DEP found that a number of sources as part of emission unit U3000 (manufacture of polyvinylidene fluoride) were not included in the Integral modeling report. An explanation is missing as to why PT3003, PT3005, PT3006, PT3007, PT3008, PT3009, PT3010 and PT3012 were not included or mentioned in the Air Modeling Report for PFCs.

2c. Response: The mass balance requested in this comment is beyond the agreed scope of this modeling exercise. With regard to modeled sources, the air modeling plan discussed the range of potential air emissions sources associated with the historical PVDF manufacture at the Site using PFCs. The discussion identified the primary sources that would be the focus of the air modeling and provided a justification for their selection. Additional details of the sources modeled for the Site and their justification was provided in March 2014 to the Department and EPA along with the AERMOD input and output files. The information provided was sufficient to identify which sources included on the historical NJDEP air permits were being evaluated. The sources identified in the comment

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

were not included in the air modeling because they would have a negligible contribution to the potential loading of PFC to the environment, especially in areas outside the plant boundary, yet would greatly complicate the modeling exercise without meaningful changes in the output as explained below.

- PT3003 was used to vent a temporary storage tank for off-spec materials. This was an infrequent source that had very low momentum and buoyancy.
- PT3005 through PT3009 are operated for about 3 minutes to purge oxygen from empty reactor vessels 2-3 times per day. The stacks are only 12 ft tall and emissions have very low momentum and buoyancy.
- PT3010 and PT3012 were not part of the routine PVDF manufacturing process and emissions were infrequent and brief.

As explained above, due to the minor impact of the above listed sources, including these sources is not needed to achieve the goals of the air modeling.

d. *Calibration/Validation: The air modeling report does not attempt to calibrate or validate the model. Calibration of the air model with this contaminant alone is no longer possible since the emissions have ceased. However, others have calibrated similar models by linking emissions to the atmosphere to groundwater contamination (Shin et al., 2011; Davis et al., 2007).*

2d. Response: Such a calibration/validation was outside the scope of this investigation as discussed previously. Furthermore, the potential effects of deposition will be considered through the proposed scope of work, which includes determining the vertical PFC concentration distribution in soil and partitioning coefficients. This will effectively address the Department's comment.

GENERAL COMMENTS

NJDEP Comment 1. Please indicate if Solvay has extended the investigation of PFCs into other neighboring states.

Response: The only part of the work under the work plan that extended to other states is within the Delaware River and the results were included in Solvay's submissions. Solvay took limited additional surface water and sediment samples in the Delware River basin beyond those called for in the work plan and would be happy to share that data with the Department.

NJDEP Comment 2. Please indicate if Solvay is conducting or intends to conduct any additional sampling of any public water supply system.

Response: Solvay has no plans to conduct additional sampling of any public water supply system.

NJDEP Comment 3. Due to the persistence of PFNA (~16 ng/l) and ongoing pumping of Paulsboro's public supply Well #8, Solvay must address whether they will continue the PFC monitoring program in Paulsboro's Well #8. In addition to sampling, please also provide a status and summary of water treatment activities that Solvay is undertaking in Paulsboro.

Response: All steps being taken by Solvay in Paulsboro have been taken either voluntarily by Solvay or pursuant to a settlement agreement with Paulsboro.

That said, as a courtesy to the Department, the results of quarterly sampling at Paulsboro public supply Well #8 which Solvay voluntarily conducted on behalf of Paulsboro in 2014 and monthly sampling (December 2014 through May 2015) of Paulsboro public supply wells Well #8 and Well #9 have been reported to the NJDEP. The results have demonstrated that concentrations of both raw and finished water exhibit low variability over consecutive 3-month intervals and that continued sampling at Well #8 is not warranted.

Construction of the additional treatment process for Paulsboro public supply Well #7 is tentatively scheduled to start the week of October 5, 2015. Confirmatory samples will be collected after the treatment system is online and those results will be shared with the Department.

NJDEP Comment 4. During the June 10, 2015 meeting, Solvay raised a concern regarding gaining access to off-site properties for investigation purposes. For clarification, the Brownfield and Contaminated Site Remediation Act, (N.J.S.A. 58:1OB-16), and the Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C-8) include requirements for obtaining off site access to properties for the purposes of conducting remediation. This would also include all investigation activities of PFCs in this case. Additional guidance may be found at http://www.n j.gov /dep/srp/offsite/. Please note, the Technical Requirements for Site Remediation defines "Remediation" as the following:

"Remediation" or "remediate" means all necessary actions to investigate and cleanup or respond to any known, suspected, or threatened discharge, including, as necessary, the preliminary assessment, site investigation, remedial investigation and remedial action; provided, however, that "remediation"

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

or "remediate" shall not include the payment of compensation for damage to, or loss of, natural resources. "

Response: As described in the September 22, 2015 work plan, Solvay will request access from the property owners of certain specified properties downgradient from the Plant. However, based on legal input, Solvay understands that the mechanisms to secure access to the property of others through the Brownfield and Contaminated Site Remediation Act and the Administrative Requirements for the Remediation of Contaminated Sites cited in the July 31 letter only apply in connection with the investigation or remediation of a suspected or actual "contaminated site" connected to the site being remediated. Thus, the off-site access provisions only apply in the context of a required remediation. Here, the access provisions would not be available to Solvay in the event a property owner is unwilling to voluntarily provide access. There is no obligation under New Jersey law to investigate or remediate off-site contamination from unrelated sources. Only the Department would have the authority to investigate or require of others the investigation of any conditions not related to Solvay's plant.

NJDEP Comment 5. Solvay refers to their investigation of PFCs as voluntary in nature. However, note that the Department disagrees with Solvay's characterization that it is acting voluntarily, since the following statutes and promulgated regulations thereunder require the remediation of all discharged contaminants including pollutants such as perfluorinated compounds: the Site Remediation Reform Act (N.J.S.A. 58: 1OC-1 et seq.), the Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:108-1 et seq.), the NJ Water Pollution Control Act (N.J .A.C. 7:14), the Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C 7:26C), and the Technical Requirements for Site Remediation (N.J.A.C. 7:26E).

Response: Despite our disagreement, Solvay performed extensive work already pursuant to a work plan evaluated by the Department and EPA, and remains committed to voluntarily performing the extensive additional work outlined in the work plan submitted concurrently with this letter.

Assuming solely for the sake of argument PFNA were a regulated "pollutant," whether or not remediation is required depends entirely on whether applicable remediation standards have been exceeded. *See, e.g.*, Technical Requirements for Site Remediation, N.J.A.C. 7:26E-1.8 (defining "contaminated site" as "all [areas]...that contain one or more contaminants at a concentration *above any remediation standard or screening criterion*"); N.J.A.C. 7:26E-3.5(b) ("If the concentration of any contaminant in the ground water *exceeds any ground*

water remediation standard, then the person responsible for conducting the remediation shall conduct a remedial investigation....") (emphasis added). In other words, any investigation of a chemical that does not exceed an applicable standard would therefore be voluntary.

As to PFCs, and specifically PFNA, there currently are no specific ground water or surface water quality standards. The generic standard for similar chemicals, were it to be applied to PFNA, is 100 parts per billion (ppb).[1] PFNA has not been detected above 100 ppb at any offsite location. Thus, Solvay's offsite investigation of ground water and surface water, including the additional work it proposed to to perform, is appropriately characterized as voluntary.

NJDEP Comment 6. As discussed in the June l0, 2015 meeting, the Department is continuing the investigation of potable wells for PFC contamination and installation of POETS in the vicinity of the Solvay Site. Following the meeting Solvay agreed to further investigate three specific potable wells located directly downgradient of the Solvay site in West Deptford Twp. Solvay did not agree to any additional actions regarding receptors in the area at this time. The Department will forward information to Solvay from the publicly funded investigation to aid in the development of the conceptual site model for the site.

Response: Solvay has completed the investigation of the three properties identified by the Department. Two of the locations, 619 Mantua Grove Road and 346-348 Parkville Station/Parkville Road, have been sampled. The validated results were transmitted to the Department on September 18, 2015). The third location, 479 Crown Point Road, was contacted and the property owner stated that no potable well was present/in use at the property.

Additionally, Solvay notified NJDEP via email on August 31, 2015 of their intention to canvass seven (7) additional properties. As Solvay has previously done, the results of the canvassing of these properties, including the existence of the well, active use of the well, and authorization by homeowner to collect a sample, will be provided to the Department.

Solvay appreciates the Department's willingness to provide information from the publicly funded investigation.

---

[1] N.J.A.C. 7:9C-1.7(c)6 and N.J.A.C. 7.9C Appendix Table 2 - Interim Generic Ground Water Quality Criteria -- Synthetic Organic Chemicals (SOC).

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

SOLVAY GENERAL COMMENT

Solvay worked with the Department and EPA to quickly develop and implement a work plan to perform an extensive investigation of the presence of PFNA over a broad geographic area within which Solvay's plant is located, but without regard to any connection to our plant site in response to public concerns raised in the media about the release by NJDEP of PFC sampling data in the late summer of 2013. The purpose of the work was to assist in responding to the concerns raised.

The work was not conducted under any regulatory program, required by any law, nor was it ordered by the Department or EPA. Solvay voluntarily cooperated with the Department and EPA in performing the work and continues to try to do so.

We want to take this opportunity to voice our disappointment that the Department does not acknowledge Solvay's cooperation in the July 31 letter. More importantly, that lack of acknowledgement undermines the validity of the comments in the July 31 letter. The comments on the air modeling report are especially troubling and illustrative of our point.

As noted above, Solvay worked for months with the Department and EPA staff to, in great detail, determine how the air modeling should be carried out. There are no discrepancies between what was agreed to by Solvay and the Department and what was performed by Solvay and reported in the air modeling report. In addition, the results of the modeling were reviewed with the responsible Department staff for months and, at the June 10, 2015 meeting -- 3 months after the air modeling report was submitted -- the Department staff appeared to agreewith Solvay's conclusions. Solvay was told that only minor comments would be provided. Instead, 2 months after that meeting, the July 31 letter includes two and half pages of comments that question the very steps that were worked out, agreed upon, and even requested by the Department staff. Solvay would welcome a meeting with the Department and EPA representatives to discuss the air modeling comments and, for consistency, requests that the personnel who attend the meeting from the regulatory agencies be the same personnel who contributed to planning efforts in advance of Solvay's submission of the report.

In addition, the Department's skepticism of the usability of the TWP data and the lack of acknowledgment of even the possibility of alternative sources of PFNA in Gloucester County – even where an anomalously high detection of PFNA occurs 2 miles from our plant in an area that is not downgradient – raise additional concerns.

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Our general response and concern is this: It appears from the July 31 letter that the Department is attempting to assign all responsibility for the investigation and remediation of PFNA detected in the environment in or near Gloucester County on Solvay, whether or not that is consistent with the science or authorized by law.

As a result, NJDEP appears to oversimplify very complex issues, and in the process, appears to ignore the occurrence and the alternative sources of PFNA and other PFCs in the environment of the area.

A lack of willingness by NJDEP to pursue an investigation into alternative sources of PFNA and other PFCs in the environment effectively makes cooperation by Solvay, or any other company that might agree to help determine the occurrence of PFCs in the environment, more difficult, and, in the end, sows confusion and prevents a complete understanding of the presence of PFCs in the environment.

REQUIREMENTS:

Solvay reached agreement with the Department and EPA to perform the first work plan. As explained in response to NJDEP General Comment 5 above, Solvay's work and work plan are not governed by NJAC 7:26E-4.

Please do not hesitate to contact me at 856-251-3409 if you have any additional comments or questions regarding this submittal.

Sincerely,

Charles M. Jones
West Deptford Site Manager
Solvay Specialty Polymers USA, LLC

cc: Via Email Only:
Ken Kloo, Director, NJDEP – Ken.Kloo@dep.nj.gov
John P. Kuehne, Deputy Attorney General, LPS – john.kuehne@lps.state.nj.us
Nidal Azzam, USEPA Region II – assam.nidal@epa.gov
Thomas Buggey, LSRP, Roux Associates, Inc. – tbuggey@rouxinc.com
Denise DiCarlo, Mayor of West Deptford, NJ – ddicarlo@westdeptford.com

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Don Schneider, Gloucester County Department of Health, NJ – dschneider@co.gloucester.nj.us
Mitch Gertz, Solvay Specialty Polymers USA, LLC – mitchell.gertz@solvay.com
Christopher Roe, Fox Rothschild LLP – croe@foxrothschild.com
Philip Goodrum, Integral Consulting Inc. – pgoodrum@integral-corp.com

SOLVAY SPECIALTY POLYMERS USA, LLC
10 Leonard Lane, West Deptford, NJ 08086, USA - T: +856 853 8119 - F: +856 853 6405
www.solvay.com

Exhibit G

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit G

Redacted as Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

West Deptford Replacement Surfactants Spreadsheets

Exhibit H

Mr. Shawn LaTourette
April 17, 2019
Public Inspection Copy

Exhibit H

Redacted as Confidential Business Information Pursuant to N.J.A.C. 7:26C-15, the New Jersey Open Public Records Act, and Case Law.

West Deptford Replacement Surfactants Safety Data Sheets